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USAF Withdraws Report Writer Bid

OTTAWA, Canada — The U.S. Air Force, apparently bowing to an unexpectedly strong show of user concern, has withdrawn its proposal that the Report Writer feature be deleted from Cobol, before the item came up for discussion at the meeting of the Conference on Data Systems Languages Programming Languages Committee (PLC) held here recently. (See Page 10 for related story).

Effectively, PLC Chairman Ronald Ham of Honeywell explained, this means that the feature stays in Cobol and probably in the new standard being developed by the American National Standards Institute (Ansi).

Technically, under PLC rules, the deletion proposal could be reintroduced at the next committee meeting, but this now appears "highly unlikely" in Ham's view.

An industry observer added that the Air Force really had proposed the deletion just to see how many users were utilizing the Report Writer feature. In that case, he added, there is no chance of the issue being revived in the foreseeable future.

ISD Awarded \$300,500 In UCC Trade Secret Suit

SAN JOSE, Calif. — Information Systems Design (ISD) has been awarded damages amounting to \$300,500 in its civil suit against University Computing Co. and two UCC employees.

The suit alleged that the UCC employees had illegally accessed ISD's computer and stolen valuable computer programs. A criminal action against one of the UCC employees, Jeffrey Ward, is still pending.

The jury in the civil action found that UCC had stolen trade secrets and awarded ISD compensatory damages in the amount of \$250,000 and punitive damages amounting to \$50,500. It denied UCC any damages in its \$500,000 cross-complaint.

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Cleanup Continues

State Mulls Flood Guides for Its Sites

By E. Drake Lundell Jr.
Of the CW Staff

HARRISBURG, Pa. — In the wake of the tremendous flood damage caused by tropical storm Agnes, the State of Pennsylvania may issue regulations requiring state DP centers to be located in flood-safe locations.

And now, almost three months after the floods hit the mid-Atlantic states, other computer users are still trying to recover from the effects of the storm and are planning ways to minimize possible flood damages in the future.

"Before we have had regulations concerning fires or riots and the necessary security measures," according to J. Robert Ippolito, manager of the state's Central Management Information Center, "but we have never had regulations covering possible flood damage."

This would mean, Ippolito said, that centers would have to be located either outside of flood districts or on upper floors of buildings in the areas.

Presently, he said, a task force is gathering data from flood-damaged centers and it will determine the final regulations governing the location of computer centers.

The problem with upper-floor locations in many cases, he said, was that many state office buildings were not strong enough to support a great deal of computer equipment on an upper floor.

"A Univac 1108 with a half a dozen Fastrand drums and other peripheral equipment is extremely heavy," he noted, "and some buildings might not be structurally strong enough to handle such a center."

At the same time, if it is decided that the state should locate all centers on upper floors, the state might have to draw up new construction regulations specifying that future buildings be structurally able to handle heavy loads in higher floors.

One fact determined after the flooding, he noted, was that safes designed to protect records and tapes against fire did not prevent water damage.

"We may require in the future that such safes be water tight as well as fire proof," he said.

The state might well require all centers
(Continued on Page 2)

IBM Ups SE, FE Rates

By a CW Staff Writer

WHITE PLAINS, N.Y. — IBM has raised the rates for systems engineering (SE) services, some field engineering (FE) services and the minimum monthly maintenance charges on selected pieces of equipment.

The price rise for SEs is between 5% and 10% and will affect the greatest number of users, while the higher rises for FE services will affect only those customers with purchased machines.

The equipment affected by the increased Monthly Availability Charges and Minimum Monthly Maintenance Charges is primarily older equipment that has been in the field for some time, IBM indicated, but does include some of the workhorses of the computer users.

Basic SE services will now cost \$23.75/hr, up from \$22; general SEs will be priced at \$30/hr, up from \$28; and complex SE services now cost the user \$37.75/hr, up from \$35.

RPG programming services now cost \$23.75 hourly, up from \$22 and other programming services have risen to \$30 hourly from \$28 hourly.

At the same time, an IBM spokesman said the best solution to most customer requirements would be to get SE services on a fixed-price basis, where the firm quotes a price for an entire job instead of having the work done on an hourly basis.

(Continued on Page 4)

Univac Front-End Device Replaces IBM Controllers

By Ronald A. Frank
Of the CW Staff

SALT LAKE CITY, Utah — A programmable front-end processor that can support non-IBM terminals as well as replace IBM communications controllers has been introduced by Univac.

The 3760 communications controller is said to be plug-compatible with the IBM 360/370 mainframes and marks Univac's initial offering as an IBM replacement vendor. The 3760 will allow the user to replace his IBM terminals with Univac equipment at "substantial savings" without conversion of IBM telecommunications software," Univac said.

Mixed System

When connecting the 3760 to a

360/370, the user will be able to utilize Univac CRTs and other terminals, retain his IBM terminal equipment, use teletype-writers or have a mixed-terminal configuration.

The front-end device performs an instruction in 750 nsec, compared with 1.2 μ sec for a similar operation on the IBM 3705, a Univac spokesman said. The 3760 will improve on the 3705 by offering automatic transmission speed detection and support for 300 bit/sec terminals, the spokesman said. Software to allow the 3760 to perform network control functions will be available "shortly after" IBM announces its specifications for the 3705 Network Control Program, Univac said. The IBM 3705 supports only IBM terminals.

The 3760 allows the user to first emulate IBM 2701 or 2703 operation and then expand to IBM 3705-type full network control capability in a step-by-step manner, Univac said. The 3760 has three I/O channels to support local peripherals such as disks, tapes and printers when operating under network control, Univac said.

Initial software for the 3760 will support Univac terminals such as the Uniscope 100 display terminal, DCT 500 keyboard-printer terminal and DCT 1000 medium-scale, remote-batch terminal. This equipment is supported without impacting IBM telecommunications access method or operating system, Univac said. Through future Univac software for IBM and teletypewriter terminals, the 3760 will operate with mixed-terminal systems, the company said.

Binary Synchronous Devices

One of the first software packages to allow mixed-terminal operations will enable the 3760 to support binary synchronous devices such as the IBM 2780, a Univac spokesman said.

Additional software packages are planned
(Continued on Page 4)

DP Position Titles 'Chaotic,' Standards Urgent, Acpa Told

By Edward J. Bride
Of the CW Staff

KENSINGTON, Md. — Position titles in the computer field are in a "state of chaos" and must be standardized, according to a new report submitted to the Association of Computer Programmers and Analysts (Acpa), headquartered here.

One reason programmers and analysts have been denied the status of professionals, the report said, is the lack of this standardization.

Last year, the federal Department of Labor said one reason the term "professionals" did not apply was because job titles were not regularized, and that they overlap and intermix in a confusing manner, Acpa reported.

Certification Needed

Certification would provide an alternative to this problem, the report continued, since the "professionalism move-

ment" requires certification of practitioners at various levels and in the various specialties.

This process, "commendable in intent, whether or not realizable in the real world," the report continued, "both requires and at the same time generates a system of standardized position titles."

"Any structure that can be agreed within the field now will speed the process of professionalism," the report promised.

The report was prepared by T.D.C. Kuch, an Acpa director and the chief information technology specialist at the National Cancer Institute in nearby Bethesda.

While the report has Acpa's approval for dissemination, it does not necessarily reflect the opinion of the organization, Kuch acknowledged.

He recommended establishment of standard, two-part titles, with the first part
(Continued on Page 4)

Flood Cleanup Continues, State Plans Guidelines

(Continued from Page 1)

to keep backup copies of program tapes and decks at locations removed from the computer center, he added.

Ippolito's center, where an 1108 was under eight feet of water, is presently keeping backup copies of programs in a safe at another center as well as in a safe at the center itself. A third copy is the working copy, he said.

While the state was concerned about implementing new regulations, some DP users were hard at work replacing and duplicating the lost data.

"Even though it has been a hard job to recover programs and data lost in the flooding, we're pretty much back to where we were when the floods hit," according to Robert Allahouse, treasurer at Jackson Manufacturing Co. here.

All of the firm's program cards had to

be repunched, he said, because after swelling with water they shrank when dried. The repunching was done while the firm was also running its production runs, he said, which slowed both operations.

The firm, which operates an NCR Century 100, began the arduous task about three weeks after the flood waters receded.

"NCR was ready to move a new system in almost right away," he said, "but we had to clean up the computer area and run dehumidifiers for a time before we could move the systems back in."

As to the future, Allahouse said "we're not going to relocate our computer center. It would be nice to move the center to a higher floor, but at the same time it would also be nice to move the whole plant to a higher floor."

Jackson Manufacturing operates a one-floor plant in the heart of the flood area here.

"After all," Allahouse said, "this is a once in a lifetime event — the last flood was over 36 years ago. We'll play the averages that it doesn't happen again."

But while the firm does not plan a major move of its computer center, Allahouse said it would probably keep a duplicate set of all program cards "at a safe location" in order to allow it to get back up faster if another flood should occur.

Computer Utilities of the North East is still operating out of temporary facilities, according to Tod Spare, DP manager.

"The walls of the building we were in are still wet," he said last week, "but we will be back in soon."

A problem, he said, was rewiring the building. "We have restored electricity to most of the building, but still have some to do before we can get back in there."

The firm, however, received new equipment within two weeks of the flood and has been operating out of temporary facilities on higher ground ever since.

"During the two weeks, though, we had to go as far as 100 miles away to find other users that would let us purchase time on their 360/20s," he said.

At the same time, Spare stated the firm received little help from IBM in finding other centers with compatible equipment, even though the manufacturer was quick to replace the flood-damaged equipment.

IBM Service?

"I'm surprised that IBM did not have any backup facilities we could use," he said, "so we had to find the other centers ourselves. That's not my idea of IBM service," he added.

In addition, Spare said some users outside of the flood area did not understand the enormity of the problem and were slow in offering help to the affected centers. "But," he added, "many were really helpful when the problem was ex-

plained."

He said the firm was considering switching from a card-oriented system to a disk system to facilitate duplication of the files on magnetic tape.

The flood set back the computer center at Mercy Hospital in Wilkes Barre, Pa., about six months to a year in applications it was planning to add to the system, according to Dave Jordan, DP manager.

"We were able to recover most of our master files," he explained, "but the floods destroyed several programs that we were working on and planning to implement."

Besides the damage to those programs, he noted that many of the potential users were not ready to implement the programs now since they had more pressing problems getting their own areas back in operation at pre-flood stages.

The damage to the hospital was so great that Jordan estimated it would be a year before it installed its NCR Century 100 there, meanwhile working out of a temporary facility at a nearby college on high ground.

A major problem in getting the computer equipment relocated and in cleaning up the center was the work schedule of the local contractors, he noted. The contractors are swamped with work and it is hard to get one for the rebuilding jobs needed, he stated.

Jordan noted several hospitals unaffected by the floods called to offer aid to the flooded-out center and that NCR also offered time on a backup machine.

One center, formerly located in a basement in Kingston, Pa., across the river from Wilkes Barre, has now moved to a mountain-top location, which was partly chosen because it is out of the flood plain.

But Paul Gozick, president of Continental Data Processing, said the move was temporary "because many people don't want to come the extra 15 miles to work and many of our customers are in the flood area."

It would be better to be completely out of the flood district, he said, because even if a center were not directly hit by the flood, the power would be off in the entire area.

The firm had to redo a lot of files after the flood, he said, even though it had moved most of the critical files to the upper story of the building during the four-hour warning it received.

Duplication Expensive

The firm will duplicate its program files if it moves back to the flood area, he said, but noted it would be difficult and expensive to duplicate all of the files since they changed rapidly.

Continental was back up and running within 13 days of the crest of the flood at the temporary location, but still faced many problems, he said.

The firm, which operates as a service bureau, said many of its accounts had to issue payrolls while the center was inoperative.

"We had to update all of those files," he noted, "and there was no standard way for the customers to report the actions they had taken while we were out of commission."

He also noted many of the firms depended heavily on their service bureaus and that in some cases there were no duplicate records to work from.

Meanwhile in Richmond, Va., The Computer Co. reported that a disaster plan with all personnel rehearsed was responsible for its success during the flood.

The service bureau operated a 370/155 in the heart of the flood area, but also had a backup 370/145 outside the area.

By alerting all of its personnel to report to the 145 site, the firm only lost one to three hours of processing time, according to Andrew Smith, vice-president of operations.

He described the second compatible machine at an alternate site as "lovely insurance."



Debris piled up in front of a first floor DP center after the flood.

CW Photo by E. Drake Lundell Jr.

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Court to Rule on Property Tax

'Paper' Challenge Seen if Education Funding Changes

By Edward J. Bride
Of the CW Staff

WASHINGTON, D.C. — If the Supreme Court overturns the current method of financing school districts — through local property taxes — only computers will be able to handle the new "red tape" workload, observers claim. States already using computers for mass property appraisal or tax administration will be ahead of the game, observers feel, because annual reappraisal is likely to be a requirement.

Under current manual methods, complete appraisals are accomplished every four, six, or even 10 years, while property owners know that values can change annually, if not more often.

The court is expected to decide this fall whether statewide taxes distributed on a per capita basis would provide a more equitable — and constitutional — distribution of property tax revenues than the current method.

Counties and states in most areas permit local property taxes to be set by municipalities, which in turn use local education needs as a chief criterion. Assessments typically vary according to the needs of the school districts, and do not always reflect the fair market value of homes or property.

Opponents of the current method of funding education claim it is unconstitutional because it permits a wealthy district to use tax revenues to fund its own schools, while a highly populated slum area raises less money and provides lower-quality education.

If funds were distributed on a per capita basis, after being collected throughout a state, these opponents claim the more populated urban districts would be able to improve local education through the increased revenues.

The California Supreme Court has sided with the opponents of the current system.

The problem is not unique to wealthy districts, however. In areas with large

industries or utilities, the benefits to out-of-town employees and consumers cross school district, local and even county lines. Yet normally, only the school district where that facility is located will benefit from its taxes.

The state of Arizona and other states, however, said they have an advantage, should the court overturn the current method of funding education.

The state of Arizona has recently contracted with an outside consulting house for an automatic mass appraisal system for its three computer centers, one in Maricopa County, another in Pima County and the other operated by the state and serving the remaining 12 counties.

Under the system, properties will be automatically reappraised every year. While the original goal of the \$300,000 contract to CBM, Inc. of Cleveland was a more equitable appraisal system, this in itself could facilitate the erasing of artificial school district lines, sources said.

Herb Foster, chief appraiser for Maricopa County, recalled there had been some objections to having properties on two sides of the same street evaluated differently, just because they were in two different school districts.

The state of West Virginia is using a CBM property tax administration system, and is looking into mass appraisal. Cuyahoga County, Ohio, is evaluating the same system.

CBM officials said they planned to visit about 20 states this year, to explain the ramifications of the anticipated Supreme Court ruling.

New Appraisal Basis

Dr. John Cook, executive vice-president of CBM, said computerizing the appraisals process would eliminate resale price or market value as the only basis for appraising property, and instead, statistics would be used.

Only 14 factors are needed for realistic

annual appraisal, he said, as opposed to the traditional "hundreds" used under more conventional methods.

Under statistical programming methods — called multiple regression analysis — the factors are defined for a particular geographical area, then universally applied for the data base.

In the case of Arizona, for example, air conditioning and swimming pools would be included as factors, while these items would not be so important, or at least not equally important, in New York or Ohio.

In West Virginia, it was noted the current system retains state involvement, to assure appraisal standardization, which could be important in retaining the property tax for educational support [CW, April 26].

Harold Casali, director of data processing for the state, said last week that the possible Supreme Court decision provides a "sound basis" for computerizing both the tax administration and appraisal systems.

Cook predicted the Supreme Court would rule that annual appraisals must

be made, and that the states would be required to control the administration (The issue, some observers noted, is how to administer property taxation for education, not the tax itself.)

The programming, Cook contended, works on nearly every third-generation computer. In West Virginia, IBM 360s are used; in Arizona's three centers, IBM, Honeywell and Univac systems are used.

First Automatic Appraisal?

The general appraisal system for Arizona will represent the first time a state has undertaken annual appraisal by computer, Cook claimed.

This system uses about 64K bytes of storage, while the related property tax administration system takes about 100K bytes, he said. Anything less would extend the program's run times beyond the efficient level, he noted.

Some of the other factors in the statistical appraisal would include square footage of living space, number of rooms and type of construction. The factors are either constants or variables that are easy to collect, he noted.

IBM Ups SE, FE Service Rates

(Continued from Page 1)

The hourly rates for SE services will be effective Dec. 1 for customers who have signed the agreement for IBM Systems Engineering Services and went into effect Aug. 29 for those users who have not.

The increases in the per call hourly rates of FE services will be effective Sept. 16.

Class 1 service during normal working hours will now cost \$25.75, up from \$24; Class 2 services at the same time will cost \$30, up from \$28; and Class 3 service has increased to \$34.50 from \$32.

Outside of normal working hours, Class 1 service will be \$33.25, up from \$31; Class 2 has increased to \$39.25, from \$36.50; and Class 3 is now \$44.75 up from \$41.50.

Generally, Class 1 includes key entry and most terminal-type equipment; Class 2 covers unit record and accounting machines and most components of 1130, 1620, 1800, S/3, S/7 and 360/20 systems; Class 3 includes most components of the 1400 and 7000 systems, 360/22 and above and the entire 370 line.

Users of Micr equipment face higher Monthly Availability Charges and Minimum Monthly Maintenance Charges, with the price up on the 803 proof machine; the 1201 proof inscriber; 1203 unit inscriber; 1260 electric inscriber; and the 1491 magnetic character reader.

Minimum Monthly Maintenance Charges have also been increased for the 1403 N1 (models 1 through 7) printer, the workhorse of many installations. The basic charge for the N1 has gone from \$183/mo to \$197/mo, for example, with

prices for other models up proportionately.

In addition, the Minimum Monthly Maintenance Charge for the 2401, 2402 and 2415 tape drives has gone up. For example, the price on the 2415 Model 1 has risen from \$100 to \$108.

At the same time, IBM reduced the Minimum Monthly Maintenance Charge on the 2702 and 2703 transmission control units. The 2702 used to cost \$57 to maintain and now costs \$46, for example.

The price is up on the 2821 control unit for a card reader punch. The Model 1 Minimum Monthly Maintenance Charge is now \$44, where it used to be \$41, for example.

"These price increases are necessary because of the increased cost associated with these machines and services," the IBM letter to customers said.

DP Position Titles 'Chaotic'

(Continued from Page 1)

denoting rank or position only. The second part of the title would be divided into two or three categories: fields, sub-fields and specialties.

In other words, he continued, rank would be equated to relative authority and might include manager, supervisor, senior, working, junior or trainee.

The field is universal: computer systems.

The sub-fields are programming, analysis, operations, engineering and sales. The "specialties" within the sub-fields for programmers and analysts would be commercial, scientific and systems software.

The specialties recommended for engineers include design and maintenance.

Kuch commented that, historically, computer people have treated the engineer as a "necessary evil, and the salesman as an unnecessary one. In fact, both are of vital importance," he noted, "and should be included in any study of jobs in the field."

There are no job requirements or duties listed in the 40-page report, which is reproduced on continuous-form computer printout.

An extensive listing of the hundreds of job categories and titles investigated, plus methods of deriving position titles, are provided.

The first 10-pages of the report outline Kuch's study, and stress the need for standardization. Most of the remainder of the report consists of various tables of titles, or the history of the development of the titles.

The titles illustrated were first compiled from classified advertisements in the com-

puter edition of *The Job Market*, a weekly publication which reprints regional advertisements of available positions.

Typical titles in the analyst area include: analyst programmer, professional systems analyst, operating systems analyst, manufacturing systems analyst, field systems analyst and financial programming analyst.

In the systems area, there are also such titles as systems professional and systems specialist.

The report has been filed with the National Technical Information Service (NTIS), Springfield, Va., under the document number PB-210 908. It is available from NTIS for \$3 in hard copy, 95 cents in microfiche.

Univac Replaces IBM Controller

(Continued from Page 1)

for network management and control including message block processing, error recovery, message switching and store-and-forward operations, Univac said.

The 3760 is modular with memory capacities ranging from 16K to 131K bytes. Expansion memory for the front-end unit will be available in 16K increments. The 3760 includes a Uniscope 100 CRT and a magnetic cassette unit for on-line diagnostic testing and the loading of 3760 programs.

A typical 8-line system with 50 CRTs operating in an all-IBM network could be replaced with the 3760 and Univac terminals at a savings of about 20%, a spokesman said.

When operating as a controller, the 3760 handles line control, character

checking, buffering, polling and automatic answer functions. Depending on configuration, the 3760 can handle up to 192 full-duplex lines with both synchronous and asynchronous devices operating at speeds from 75- to 9,600 bit/sec. A 50 bit/sec capability together with automatic speed detection and programmable speed options are planned, Univac said.

The 3760, under the Univac one-year rental plan, starts at \$1,213/mo with maintenance. Purchase prices start at \$54,500. On a five-year lease plan the monthly cost drops to \$947. Prices for the IBM 3705 front end, which also performs network control, start at \$1,200 on a 24-month extended-term rental, with minimum purchase price at about \$57,000. First delivery of the 3760 is scheduled for January 1973.

Mini Scores Movies And Gets High Marks

BOSTON — Scoring of a film competition here was known within an hour instead of a week, with the help of a minicomputer located in the home of one of the judges.

The Boston chapter of the Information Film Producers of America judging the "Cindy" competition normally evaluates the films in one or two days, with manual compilation of the balloting taking about a week.

A Digital Equipment Corp. PDP-8/E, owned and programmed by Stephen Kallis, printed out the refined scoring of each film voted upon, as well as a tabular listing of all judging factors used to evaluate the film, with accuracy to four decimal places, permitting a detailed qualitative evaluation of each film.

Kallis, a Digital Equipment Corp. employee and member of the association, said he felt the application of computer analysis to film judging was long overdue.

Erring Husbands Tracked

TORONTO, Ont. — An Ontario Government office is setting up a computer system to keep track of husbands of deserted wives who are not maintaining support payments.

Attorney General Dalton Bales said the computer system will provide up-to-date information on payments that are in arrears, but admitted the system will diminish in value if the errant husbands cannot be tracked down.

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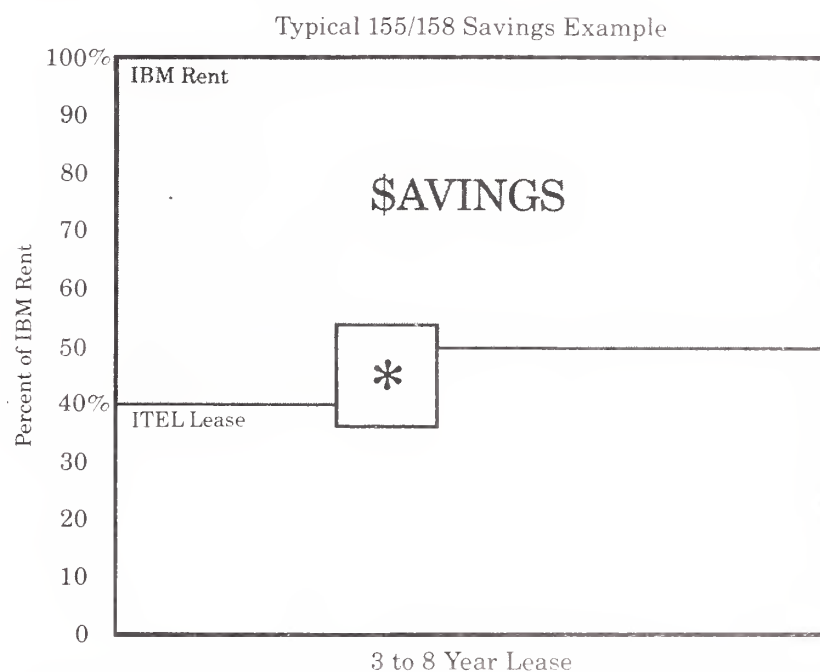
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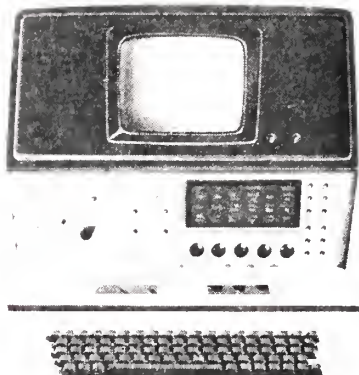
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| Duplication | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| Left zero fill | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| Upper and lower shift control | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
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Discipline Problems Decrease
As Students Get Closer Together

By Molly Upton
Of the CW Staff

ONTARIO, Calif. — A computer, an impersonal tool, is being used to alleviate alienation among students at Ontario High School and foster incentive in the educational process.

Under the Care and Share Project, which individual teachers may choose to administer, students fill out forms listing in order of preference the classmates, he or she would like to be grouped with for a period of three weeks.

A PDP-10 at Claremont College determines each student's popularity in relation to the rest of the class, groups students according to their mutual choice and uses the popularity to "seed" each

group with a popular person. It also rates each group's cohesion factor, or how strongly the group members selected one another and provides a listing of mutual first choices.

Changing Matrix

"The kids begin to learn the significance of their choices," observed James Randles, research counselor. "As they begin to understand a little bit more about the algorithm the computer uses, they really turn on to it." The choice matrix changes all over the place during the course of the year, he added.

The teachers use this information to plan group assignments and prepare for problems each group may encounter.

The program is based on the assumption that students will learn more eagerly and more thoroughly when they work toward a common goal with a cohesive group of people of their own choosing.

About 1,000 of the 1,200 students are in the program in one or more classes, and 85% of the students have indicated favorable responses to the idea, and would like to see the project continue, Randles said.

Overall class performance has improved with the program, according to teachers, and the school has noted a reduction in discipline problems. Although the rate of discipline appearances for students not involved in the project remained relatively constant, the rate for project students dropped significantly, Randles said.

Administrators are also finding that a high cohesive factor within a group does not necessarily result in improved class performance by the individuals.

Randles observed that students who felt very secure within a group possibly are not motivated as strongly as others who felt a greater need to contribute.

Job Bank Hopes to Go
Out of Business Soon

HARTFORD, Conn. — A volunteer organization whose sole purpose is to go out of existence hopes to reach its goal with the aid of a computerized skill bank set up with help from its friendly banker.

Conn-Vest was organized to help unemployed engineers find jobs, and currently has files on 100 "active" members and 550 inactive members. The Connecticut Bank and Trust Data Services volunteered computer time and helped design, along with Conn-Vest, the skills inventory system.

Each person is identified by a number, and his education, work experience, area of technology, field of service and other information are included. Data on the members is cross-referenced for numerous job possibilities, and run against job listings.

When all its members are employed, Conn-Vest will be out of business.

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Editorial

Chaos on the Home Front

"Position titles in the computer systems field are in a state of chaos," reports T.D.C. Kuch (Page 1).

The profusion of titles (Kuch found everything from "configuration data specialist" to "OS computer professional") is not only confusing to the government and the public, it's confusing to people in the DP field. Man doesn't live by title alone, but widely understood titles are a great help in comprehending where a man has been and where he is now.

Kuch, in his report, recommends a title system that, while it may not be the perfect solution, is at least workable. Even though he has not defined his terms, we agree a title such as "senior commercial programmer" tells us more than "Cobol OS programmer."

And, unlike the General Services Administration job classifications, Kuch's system permits the creation of a great variety of titles which would be self-defining.

Kuch has given us a start. Now let's hear comments from other users.

Concern Over Privacy, Banks Misdirected

Concern over the issue of privacy and misuse of data in computerized files is, in my opinion, misdirected toward limiting the collection of information.

Also, the trend toward use of the Social Security number as a universal identifier appears as inevitable as the accumulation of personal data itself. The alternative of establishing another number to serve the function of identification does not solve any problems regarding guarding of privacy. I would favor the use of the existing, established Social Security number for identification.

Let's face the fact that the hole in the dam is too big to be plugged and let's stop wasting our efforts trying to do so. Data banks need not be bad if used prudently, as evidenced by the recent case where it was possible to quickly locate a TB-afflicted child of a migrant worker's family.

In the face of current trends it seems unrealistic to try stopping the accumulation of personal data in computerized data banks, and all the efforts should rather be channeled toward establishing rules and guidelines in legislative form for collecting, correcting and protecting this information.

Ed Viktor

Data Processing Manager
Crain Communications
Chicago, Ill.

More on 'Writer'

As a member of the Association of Computer Programmers and Analysts (Acpa) and the prime mover behind the Cobol Report Writer Resolution I feel compelled to reply to M.L. O'Connell [CW, Aug. 30].

I still feel our criticisms are valid. The problem seems to be in the definition of "user." In my eyes, and the eyes of many members of Acpa, the users of Cobol are the programmers and analysts of the computer community; yet the "63% of the

committee" which is supposedly representative of users is really more representative of big business and government.

This in itself is not so bad if these representatives solicit opinions from their technical staffs or are themselves members of the technical staffs. Yet we know this is probably not the case.

Note also that the resolution was not "irate... at the consideration of the proposal," but instead was aimed at heading off, if possible, what we felt was an ill-advised action.

This is exactly why Codasyl holds meetings and considers proposals — to gather opinions. We expressed ours in what was the only way available to us if we were to believe the information available to us.

In this case we felt that any move to precipitously drop an established standard feature in wide use in the "user" community is contrary to the goals of the standards effort. Thus we passed a resolution at a regularly scheduled general membership

meeting.

Since that time, of course, we have learned that Codasyl delayed action on the proposal. To this we can say nothing more than "bravo!" Acpa has, of course, been in contact with Ansi and Bema since that time.

If Acpa members feel that such a resolution is warranted and vote to express an opinion such as this, then it is incumbent upon the officers of the organization to see that the opinion is made public. This they did.

I hope that this professional organization never becomes so buried in red tape as to be unable to respond in like manner when necessary.

Lawrence A. Ruh

Frederick, Md.

CICS 'Excellent'

In reference to the article concerning the CICS seminar presented by CHC [CW, Aug. 23], CHC would recommend CICS above all other software teleprocessing packages presently available on the market (i.e. both

sion, increasing technological complexity, expansion of organization responsibility and change of organizational level.

Volume Growth — Today there are 80,000 computers installed in the U.S., with approximately 220,000 people doing systems analysis. By 1975, the number of computers will grow to at least 150,000. A linear ex-

Viewpoint

trapolation of systems requirements, which is at best conservative, would mean a need for 410,000 analysts, or a gain without attrition of 190,000.

In addition, some 80,000 to 100,000 more managers will be required by 1975, of whom at least half will be drawn from the ranks of present-day analysts, thus adding 40,000 more to the requirement.

Assuming a low 4% annual at-

trition through deaths, pregnancy, retirement or field exits adds another 30,000 to the shortage. And, of course, at least 10,000 would be required to teach or train all of the new entrants identified above.

Scope Expansion — The scope of systems analysis applications is expanding. In part because of higher costs, management is increasing the number of applications being considered for computer use.

Assuming only a 10% increase in applications increases the number of analysts needed by at least 40,000.

Increasing Technological Complexity — There is no question that hardware and software are becoming more complex. Five years ago data base design consisted of a tape layout; today the availability of many storage hierarchies has generated a new technology of data base management.

Similarly, the advent of data communications and high-speed terminal use has increased the complexity of the analyst's job by at least 10%. This would add another 40,000 analysts to the requirement, to compensate for the additional difficulty.

Expansion of Organization Responsibility — There are still numerous places outside data processing in the organization where systems analysis is performed. Operations research, industrial engineering, methods and procedures are all branches of the overall "systems" field. It is clear that these will be gradually combined into one organizational element, probably as a part of the "information systems" group.

Change of Organizational Level — Finally, and perhaps most significantly, the organizational level at which systems are being built is gradually increasing. No more "bottom-level" systems such as payroll for the payroll department, or production control for the production controllers.

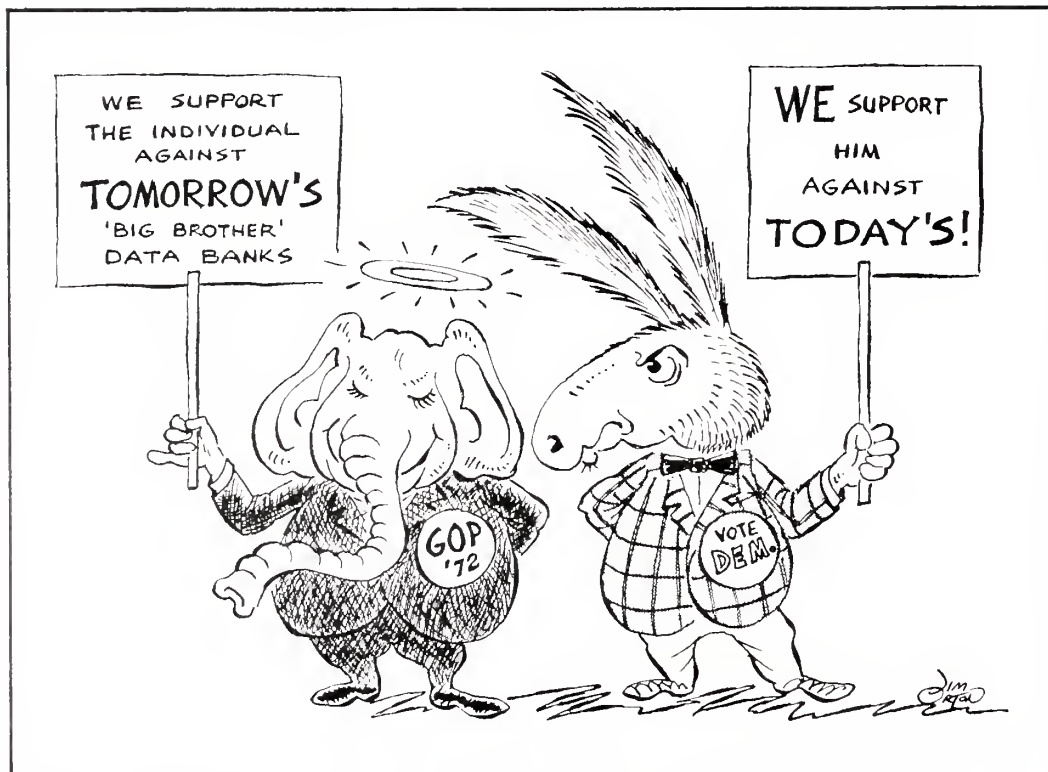
Integrated, data base-oriented systems are now designed routinely, and they cross organizational lines. Thus, they are being built for a far higher-level user, rather than the unit manager level. This requires a far more communicative and tactful analyst, with far more systems skills than most of the current practitioners.

Assuming that only 25% of the present-day analysts are unqualified (and there are those who would think me generous) requires replacement of 55,000 more analysts.

There will be an aggregate requirement for new analysts in 1975 of 420,000. Assuming that a two-year training program is reasonable, we must start in 1973 — and thus take 55% of the college graduating population of 1973!

Let us, define the true requirements of systems analysis; establish a definite discipline; build some decent training programs; recruit some qualified people into the field; and upgrade some of our present professionals.

Brandon is president of Brandon Applied Systems, Inc., New York, N.Y.



Acpa's Remarks on Codasyl Were Really Professional

The M.L. O'Connell letter reproduced from the Aug. 30 issue of *Computerworld* is very interesting both from what it says and what it does not say. O'Connell

The Taylor Report By Alan Taylor, CDP



seems to feel the Association of Computer Programmers and Analysts (Acpa) should not have attacked the Conference on Data Systems Languages (Codasyl) for an apparent lack of interest in soliciting user opinion [CW, Aug. 16]. He cites three points to support his contention, and asks one rhetorical question, apparently designed to show that the attack was unjustified. A letter from Lawrence A. Ruh, an Acpa member, also commenting on the O'Connell letter, appears on Page 10.

Three Points, a Question

The three points are:

- 63% of the Codasyl Programming Languages Committee (PLC) is classified as users.
- The Codasyl Planning Committee exists for the sole purpose of informing the user community and soliciting user response.
- Several hundred proposals are received by Codasyl each year.

The rhetorical question with which he concludes was, "I wonder if the public would feel more secure if Codasyl arbitrarily refused to consider some of the suggestions it receives from users?"

Some Underlying Facts

Apart from some obvious questions — such as why a Planning Committee is restricted to a public relations and opinion-sampling function — the normal reader unfamiliar with Codasyl documents might easily believe that this argument adds up to a reasoned refutation of the Acpa attack.

Codasyl documents, however, show that very few outside user proposals are received by Codasyl each year — not hundreds. From the minutes, I found an average of one such proposal for each of the last five years! That's not what I call much success in soliciting user opinion.

In my view the PLC's tolerance of this level of inactivity year in and year out without confronting the people responsible — both those on the PLC itself and those on the Planning Committee — is exactly the type of behavior which Acpa appears to suspect.

O'Connell's attack on Acpa seems to prove the Acpa case, when read in conjunction with the Codasyl PLC minutes.

And O'Connell should know the facts. For, although he does not say so in his letter, he has been sitting on the PLC for years — first as the representative of Sanders Associates, and now as representative of North American Rockwell. Unlike Acpa or any "privileged" user, he can go through those hundreds of proposals that he talks about (really about 200) and separate those initiated from within

Codasyl, or within the Ansi area, or from their Japanese or European equivalents.

Let him discount those before he counts the number of actual items the Cobol user community, unassociated with Codasyl, has produced. Then let him claim there is any real attempt by the PLC to ensure that the general community is involved.

Acpa Not Alone

The Acpa is not alone in wanting much more information about the actions of the PLC both before and after it makes its decisions.

Hamilton Armstrong, a DP manager in Syracuse, N.Y., has been trying for years to get information so he could put a simple suggestion into proper form — and push it against any committee arguments. But he cannot find out what are the arguments against his idea.

Dale Kluster, head of the data processing department at Mankato Area Vocational Training Institute in Minnesota, told me he cannot get adequate information with which to train his students on the problems involved in Cobol. Kluster's feelings were echoed by Dr. Enoch Haga, executive director of the Society of Data Educators. Haga feels the Cobol position in general is frustrating many teachers.

"We only see one side in the Codasyl publications," Hager said. "Yet in practice we know that the lack of common-

"Recent actions by the PLC itself, by the Codasyl Planning Committee and by the PLC organization's representatives — such as O'Connell — appear to indicate they all wish user inaction and ignorance to continue unaltered."

ality between Cobol's is serious." None of these people, I would think, feels that O'Connell's letter is an adequate reply to a very reasonable and responsible request from a professional group.

Situation Worsening

Another point of interest is that the situation of the user appears to be worsening, rather than improving.

Recent actions by the PLC itself, by the Codasyl Planning Committee and by the PLC organization's representatives — such as O'Connell — appear to indicate they all wish user inaction and ignorance to continue unaltered. At any rate, new barriers to dissemination of Cobol information appear to be building almost as quickly as public interest in being informed is spurred by professional societies such as the Acpa.

For example, I had a letter from the PLC dated July 24 which concerned the planned action to set up a chain of national depositories where Cobol users could come to find out what was happening.

In the letter the PLC "suggested" that the contents of the depositories should be restricted. Users in general should only be able to find in them the PLC minutes (of

M.L. O'Connell's Letter

The Aug. 16 issue contained an article on the Association of Computer Programmers and Analysts (Acpa) and its criticism of Codasyl's action on the Cobol Report Writer feature.

It is sad and disheartening to read of a professional group such as Acpa that has responded to uninformed rhetoric and has endorsed the distorted view espoused by others.

Acpa has accused Codasyl of "apparent lack of interest" in soliciting user opinion. The fact is that the Codasyl Programming Languages Committee, the committee in question, has a user membership equal to 63% of the committee.

Its user members include U.S. Steel Corp., the National Bureau of Standards, American Telephone and Telegraph, the Canadian Federal Government, Xerox and the U.S. Air Force (the largest user of computers in the world).

In addition, the Codasyl Planning

Committee exists for the sole purpose of informing the user community of Codasyl activity and soliciting user response. Guide International, representing more than 1,000 IBM computer users, is a member of the Planning Committee.

To accuse Codasyl of "questionable motives" in ignoring users is analogous to accusing a drowning man of ignoring the ocean into which he is sinking.

It is also interesting to note the irate reaction from many users that resulted from the news that Codasyl was even considering deleting the Report Writer feature.

Like several hundred proposals received by Codasyl each year, I'm sure this one will be given due consideration. I wonder if the public would feel more secure if Codasyl arbitrarily refused to consider some of the suggestions it received from users?

what had occurred), the Codasyl-issued Journal of Cobol Development (which again only reflects the results of the PLC decisions), and some undefined "major" working papers, the PLC suggested.

Apparently the user should not be allowed to see details of changes that might take place in the future when the PLC gets to them — such as the USAF proposal to drop the Report Writer.

Public Domain?

Just to make certain that the user would be prevented from seeing the proposals before the PLC acted on them, the letter said that the PLC had reaffirmed that proposals are not in the public domain — without mentioning how this can be — when the Codasyl Constitution specifically states the performance of Codasyl work, not just its results, shall be in the public domain (Item 1.2 Purpose).

The acceptance of the PLC-suggested restrictions would leave the user unable to provide input about forthcoming changes, and also unable to use the depositories to compare the Cobol compilers that many of the members of the PLC are trying to "sell" as "standard" with the latest versions of Cobol.

These compiler differences are of great interest to users, but are studiously ignored by Codasyl.

At the same time, possible timely access to the proposals was cut off indirectly. The first set of minutes received for the depositories and following the assurance of PLC cooperation in bringing complete information to ordinary users showed that the Planning Committee — whose function is apparently to get information to users, not to plan — had been removed from the distribution list for proposal material!

Where previously 20 copies of all proposals went to the committee, now it would only be sent a copy of an informal letter which the secretary sends to the European Computer Manufacturers Association after each meeting!

Obstruction of National Depositories

Nor were these the only ways in which the PLC moved to make the Society of Certified Data Processors' project to make the information available across the country more difficult. The PLC also rejected an SCDP request for about 12 copies of its minutes, and restricted the Society to a single one. This action,

which may yet cause the abandonment of the whole project unless the SCDP can raise a minimum of \$2,000 to finance the necessary copying, was called necessary by the PLC because of printing costs.

But this claim about printing costs did not ring true to me when I received the PLC letter.

It seemed even less true, moreover, when I met with PLC Secretary William C. Rinehul later. He told me that the USAF produced the minutes — and that it does not charge the PLC for this. Indeed, he said, he had never seen any bills for the minutes, either internally or externally!

(I have not seen any in the PLC minutes, which is where they should be if they exist.)

Cheap Production Used

Rinehul did tell me, however, that additional copies were so cheap to produce that the USAF found it better to produce up to four extra copies rather than bother getting the duplicating machine operators to count the actual needs. (They are produced only in fives, not in units.)

How the PLC will explain this discrepancy I do not know. I do know that if the given explanation is false, then I will personally call for the immediate resignation of all the PLC members associated with using such a procedure. And I hope that the Acpa will also investigate the matter.

More restrictions on information — some perhaps temporary, some apparently final — also appeared during my meeting with Rinehul. The letter from the PLC chairman had said that "the complete PLC archive is available to your organization" and "you are invited to review these files and make a copy of whatever material you deem appropriate."

But the SCDP found that the PLC secretary neither had a complete PLC archive (even the minutes are not complete, and rejected proposals are simply thrown in the waste basket), nor would he let the SCDP read any material other than the minutes — which include only details of what has happened — too late for a user to make his voice heard.

This restriction can, of course, be lifted, but the loss of material from the archives may well be permanent.

Under these circumstances I feel that the PLC owes the Acpa and the Cobol community an immediate and full answer to all its questions — and that M.L. O'Connell should retract his attack on Acpa as publicly as he made it.

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Little Support for Cobol Support Fund

Few people or organizations made immediate contributions to the Cobol Support Fund [CW, Aug. 16].

Oscar Watts, the fund chairman, said he hoped later contributions would make it financially possible for the schools across the country that have volunteered to help the ordinary Cobol user to be given the necessary material.

Among the contributions was one from L. Dale Holmberg, acting treasurer of the Society of Professional Data Processors. Another contribution came from A. Everett Winne of Springfield, Mass., who wrote, "We have never used Cobol and don't know if we shall, so this is a personal contribution as I admire your purposes and determination." The only other contribution received at this date is from K.B. Howard of Visalia, Calif.

Around \$2,000 is needed to supply the proposed eight centers with the basic material to operate.

Contributions can be sent to Oscar Watts, Cobol User's Support Fund, 1627 Locust St., St. Louis, Mo., 63103.

The Professional's Viewpoint

Canada User Refutes Report Writer Ineffectiveness

Part of the basis of the USAF's request that Codasyl drop the Report Writer from Cobol is that the language is ineffective. [CW, Professional Viewpoint Page, Aug. 30.]

Here are the opinions of a user who has used the feature widely, and who notes the difference between inefficiency implementations of the Report Writer and the very different case of inefficient language facilities.

By John Seitz

Special to Computerworld

I have been actively engaged in commercial and technical data processing for approximately 15 years, as a programmer, analyst, systems programmer, manager and product designer.

I currently head both data processing education and administrative data processing for a three-campus junior college here in Quebec, Champlain Regional College.

I have had the pleasure of serving as a user on the joint Share/Guide Cobol Project and on that project's advisory board. I also initiated and served as project manager of the Guide (language) Processor Compatibility Project, and on several occasions reviewed Cobol documentation for IBM as a user.

I also originated the Cobol standard which for some time became the *de facto*

This Professional Viewpoint Page was prepared by the Society of Professional Data Processors.

user standard for IBM Cobol-F, largely, I suspect, because it was the only game in town, and Raytheon undertook to distribute it free until requests reached the 1,500 level.

Both for myself, for my college and on behalf of the SPDP, I wish most strongly to object to any proposal which would eliminate the Report Writer feature from

the Cobol language, and, instead, would encourage its inclusion as part of the full standard, rather than giving it its current adjunctive status.

Perhaps the best illustration of the seriousness with which I regard the need for a Report Writer feature is given by a decision now some five years old. The Cobol-F Report Writer implementation was perhaps not IBM's most unqualified success.

Despite that fact, the standard I wrote, implemented and enforced at Raytheon in a rather large shop required that Report Writer be used in all cases in which a report could be anticipated to exceed one page.

This met with considerable resistance on the part of the applications programming staff, but not so much as met the implementation of Cobol as the standard commercial language in the same shop, although most of the same arguments

against it were employed.

The major objections to Report Writer at the time appeared to be the same as those applied to early Cobol, wherein the language (or feature thereof) itself was blamed for what, essentially, was a rotten implementation. The greater part of the objections seems to stem from a failure on the part of the implementors to comprehend the differences between, and asynchronicity of, logical breaks in the data and physical breaks in the output medium, i.e., pages.

Such difficulties have neatly and automatically been resolved in numerous other instances, and I see no technical reason why they cannot be so resolved for Report Writer. The logic for a good fixed-page virtual memory system, or a reasonable message handler in communications, appears to be almost identical to that required.

In every other area of input and output, which essentially is what we are dealing with, the trend — better, the demand — is toward automation, except in the area of printed output. No one today would think of coding his own tape I/O or disk I/O, at least in any commercial shop worthy of the name, if the required functions exist in a higher-level language.

However, as one who finally was relieved of the necessity of spending countless early morning hours trying to figure out just where some clown had hidden his fifth tape read, I find myself now in the position of using the same hours to figure out where he put his third heading routine.

I suspect that, in addition to our unspoken hostility to anything new, the non-procedural aspects of Report Writer are what disturb the programming fraternity.

What I am getting at is that most of the objections I hear to Report Writer generally stem from some failing on either the part of the implementor or the objector, rather than being concerned with Report Writer as a feature of the language itself.

Cobol is a (possibly the) commercial data processing language. The bulk of commercial data processing work, at least at present, is to produce reports. Yet we find a proposal to drop a feature of the language which permits automation, standardization and regulation of the generation of reports.

From personal programming and management experience, I know that it is quite simple to maintain and modify the reporting aspects of a program coded with Report Writer, and quite often not simple to do it at all if the program has not been so coded.

Thus I believe that inquiries directed to DP management, as opposed to programming staff, would, in the case of those with experience with Report Writer use, result in at least a qualified approval — despite the rotten implementations to date.

I feel there is another major use possible for Report Writer, and that is in the transition from smaller machines to what one could call Cobol processors. Most small shops are working with some form of RPG, which usually itself is somewhat non-procedural.

An intelligently designed Report Writer easily could serve as a transfer vehicle into Cobol. Indeed, in preparing several language specifications, I insisted that Report Writer be included in Cobol, and that it be compatible with the RPG being designed for smaller machines in the same line — or, rather, that the RPG be compatible with the Report Writer.

I see Report Writer as offering many solid benefits in areas such as program standardization, maintenance and management. I see objections to it stemming from either poor implementations in the past, or personal ignorance or prejudice.

Seitz is a member of the Society of Professional Data Processors.

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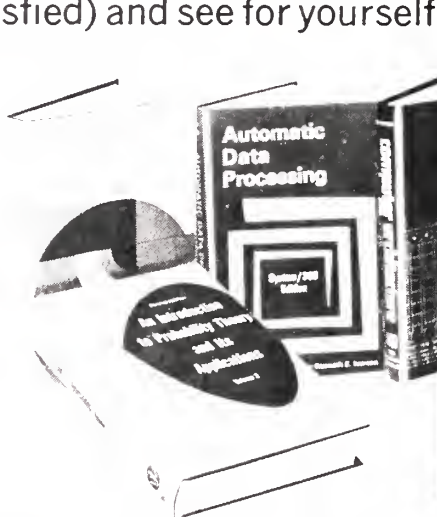
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Random Notes

General Ledger Planning Topic of Free Seminars

PITTSBURGH — The design of general ledger accounting systems will be discussed at a free one-day seminar, including luncheon, sponsored by Software International Inc., and scheduled for the Pittsburgh Hilton Sept. 13.

The seminar program, intended for both the DP professional and the accountant, will be repeated at the Barbizon Plaza in New York City on Thursday, Sept. 21.

Walk-in guests are welcome at either session, a spokesman noted from company headquarters, 279 Cambridge St., Burlington, Mass., 01803.

Interactive Data Takes Over Production of S&P Data Bases

WALTHAM, Mass. — The Standard & Poor's automated pricing services, which include the periodic production of machine-readable data bases, usually on magnetic tape, for distribution to the financial community, have recently been acquired by Interactive Data Corp.

The services, which complement Interactive's time-sharing service, include the Investors Statistics Laboratory (ISL) data base, corporate and municipal pricing files and a dividend-reporting service for customer-specified stocks. The services are available on subscription basis, from Interactive at 486 Totten Pond Road, 02154.

S 3/6 Controls Data on Funds

WHITE PLAINS, N.Y. — The Health, Welfare and Pension Fund System software, soon available from IBM, will enable the S 3/6 user to maintain detailed records on funds administered jointly by employers and unions.

The package performs updating and maintenance functions on five major files, and generates a range of reports needed to confirm the status of the funds. A fully supported Program Product, the system is written in RPG-II and will be distributed under license for \$175/mo, starting in the third quarter of this year.

New Yorkers Access 360/195s

NEW YORK — Businessmen and engineers now have access to two IBM 360/195s in St. Louis, through a Data 100 Model 70 terminal at a McDonnell Douglas Automation branch office at 405 Lexington Ave.

The terminal is equipped with a 600 card/min reader and a 300 line/min printer for remote batch work. A customer work area is provided at the terminal site and a keypunch is available, the company said.

Handbook 'Tells All'

DP Standards Groups, Goals Listed

By Don Leavitt
Of the CW Staff

MINNEAPOLIS — Answers to the whys and wherefores of EDP standards — including, for example, the differences between the Conference on Data Systems Languages (Codasyl) and the American National Standards Institute (Ansi) — have been combined in a book by Margorie F. Hill of Control Data Corp.

The softcover *World of EDP Standards* shows the history, objectives, membership and organization of many groups on both the national and international

levels. Though based on official publications from these groups, it attempts to show concepts rather than the formal language used by some of the source documents.

The book explains both how and why Ansi defines a standard subset of the Cobol language for the U.S. DP community, and how Codasyl defines the language and all its component parts.

The *World* reiterates the birth of Codasyl, starting with the conference at the Pentagon in May 1959 to consider the feasibility and desirability of creating a

single language that could be common to all business applications.

The book notes Cobol-60 and Cobol-61 which came from Codasyl before the organization that is now Ansi took over standardization.

Codasyl Organization

Codasyl now is organized as five standing committees, each with its own membership rules. The current structure includes an Executive Committee, Planning Committee, Systems Committee, Programming Languages Committee and the recently organized Data Description Languages Committee.

PLC, the group most directly concerned with Cobol development, is limited to no more than 25 member organizations, with the added stipulation that not more than two-thirds of the membership can be from any one segment of the industry, i.e., users or implementors.

Charged with developing language features leading to compatible, uniform source programs and object results which require minimum conversion for program or data interchange between different types of hardware, Codasyl has just released its first quarterly newsletter to keep interested parties informed.

Codasyl is supported completely by the contributed work of its members. There are no membership dues or other assessments, Hill's book notes.

Identified as Tech Memo 4, *The World* is available in limited quantities for \$3/copy from Control Data Corp., 8100 34th Ave. S., 55440.

System Builds Forecasts, Plans From Daily Data, User Calendar

MOUNTAIN VIEW, Calif. — The Salesplan software recently announced by A.V. Cameron Business Systems is designed to use daily information on sales, inventory, shipments or orders, as gathered by point-of-sale terminals and other data collection systems, to build realistic forecasting models.

Although the system's name indicates the developer's original interest, the package's capabilities can be applied equally well to any situation — manufacturing, service operations or retailing — that is sensitive to daily or seasonal changes, the company said.

User Calendar

The package couples the daily input with a user-provided calendar of holidays, paydays, promotions and other outside factors that might affect sales, production or whatever will be forecast. The program builds a stochastic model which allows for these individual factors as well as for seasonal or long-term trends.

One of the most immediate benefits of the Salesplan programs is said to be improved labor scheduling accuracy. With the daily input and known labor productivity standards, the programs can optimize manpower usage, and even a slight improvement in that area can bring "dramatic improvements" in a company's profitability, Cameron noted.

The model building and forecasting procedures used by Salesplan follow four basic steps. The programs identify a "parsimonious" model structure by comparing basic properties of a model with corresponding properties of the available data series.

The software then estimates the maximum likelihood parameter values of the identified model and applies diagnostic checks to the residuals to verify the goodness-of-fit of the stochastic model to the given data series. Finally the system uses a recursive forecasting algorithm derived from the stochastic model.

The algorithm is said to be both adaptive to the factors introduced through the

calendar input, but computationally efficient as well.

The package is also adaptive to whatever form of data is made available to it from the user's data collection system, the firm said. Salesplan does not perform any of the basic data gathering, Cameron reiterated.

The Fortran IV package is designed to run in a 100K-byte partition under either DOS or OS/360. Because of the choice of source language, it can be modified to run on other hardware, the company said, although noting there might be a charge for such adaptation.

Salesplan lease prices are as low as \$85/mo.

The company is at 575 S. Rengstorff Ave., 94040.

Unattended Files Sent CPU-CPU

PITTSBURGH — PPG Industries' Glass Division has put a potpourri of its internally developed utility packages on the market, and the DOS/360 user can find some interesting items in the collection.

Item: Two of the programs provide overlapping of printing and punching with other processing so that users can gain anywhere from 10% to 40% faster I/O according to PPG estimates, without going to spooling.

Item: A set of generalized Btam-based transmission programs supports the switching of files between computers, even if one is operating under DOS and the other under OS.

Item: A generalized and modular file-building system, made up of four programs, provides for the creation of either sequential or indexed-sequential files, based on the user's Cobol File Description (FD) entries and the initial data.

Two graphics programs are also available to create contour plots or regressive analysis charts directly on a 1403 printer. A more generalized 1403-based graphics package is expected to be released

shortly, the company noted.

All of the packages are designed to function in 18K bytes or less with very modest goals. The file transmission programs, for example, are coded to pass no more than five files at any one time.

This limitation was included, PPG said, so that the package could be used in an unattended transmission, without risking extensive damage to many files in case of transmission problems.

Records transmitted from CPU to CPU can be no more than 1,125 bytes long, but the files themselves may be any length.

The company expects to distribute some of the utilities in source language, if user modification seems a useful capability, but the simpler ones, such as print or punch overlap, will probably be available only in object code.

The programs are provided under perpetual license agreements for one-time charges from \$200 to \$4,000/each.

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The Peripheral Power

Package Supports File Maintenance, Multiple Report Prep by Non-DPer

DOVER, N.J. — The Re-Act system developed by Cybertech Data Systems Inc. and now available from Boeing Computer Services Inc. (BCS) provides the non-DP professional with a four-pronged tool to work with data files without bothering the programming staff.

Given 22K bytes of 360 storage, Re-Act can be used for generation of multiple reports in a single pass of a file; for easy printing on preprinted forms; for file maintenance; and for a range of utility functions.

ports can be created in a single operation and processing on the retrieved data may include addition, subtraction, multiplication or division. Five levels of sub-totals can be accumulated.

The File Maintenance subsystem supports all normal updating functions on existing user files, whether in sequential or indexed sequential form.

An overlay grid is used with the Matrix subsystem for printing more data on preprinted forms such as W2s, paychecks or invoices. The "target" form is

merging and sorting records, as well as handling duplicates.

A Re-Act demonstration package allows users to try the system with several sample programs, but not to use it for any prolonged period. The demonstration package "self-destructs" six weeks after it is sent out, BCS noted.

The complete Re-Act system is available on perpetual license for \$15,000 and short-term leases can be arranged.

BCS is at P.O. Box 708, 07801.

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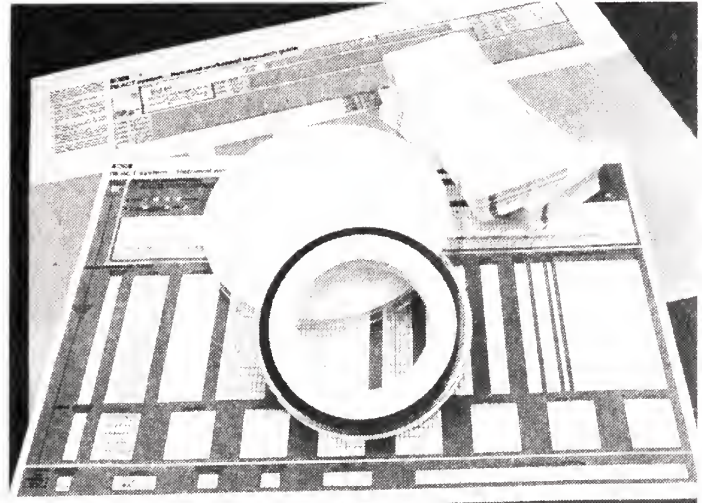
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The "Re-Act" program provided with the demonstration package will "self-destruct" after several weeks, so users cannot abuse the test privilege.

Re-Act coding is expressed in English on worksheets designed to be easy for both the coder and the keypunch operator, BCS said.

Four Subsystems

There are four subsystems within Re-Act which can be used separately, a company spokesman noted. The Retrieval subsystem accesses files in a data base, processes the data, then formats and writes reports.

As many as 40 different re-

placed under the transparent grid and the user places his data exactly where he wants it to print.

From the grid keypunching picks up the desired data fields and two coordinate numbers to pinpoint printer locations and to control line skipping.

The Utilities subsystem allows the non-DPer to rewrite, reorganize and reformat data files. In addition, the programs within the subsystem ease the standard DP capabilities of matching,

Extensible Language Data Sought

HAMILTON, Ontario — A bulletin on extensible languages, proposed last spring by ACM's Special Interest Group on Programming Languages, is stalled in the planning stage, according to the editor, Professor Nicholas Soltntseff of McMaster University.

The bulletin is intended to provide an informal means of exchanging ideas and experiences on the user-augmentable languages, but no articles have been contributed yet, Soltntseff said.

Material including statements of current research problems and proposals for design or implementation of a language would be welcome, as would papers leading to a coherent overview of the field. Lists of reports available for free distribution or for sale, and brief descriptions of specific applications or implemented languages are also desired, the professor added.

Soltntseff is at the Department of Applied Mathematics of McMaster University, here.

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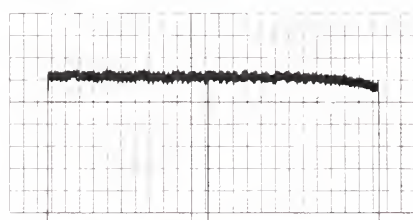
Earlier this year, we picked twenty-five 3200 fci premium tapes at random and tested them for output.

The tapes were by BASF and four other major makers. The criterion was the National Bureau of Standards Amplitude Reference Tape.

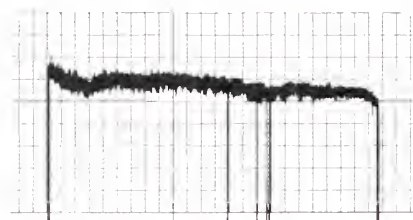
Test results? BASF/2000 A.D. was far and away #1 in uniformity — bit to bit, reel to reel.

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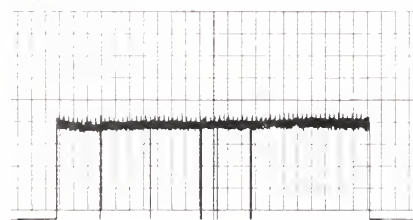
If you look right, you'll notice four typical charts and traces from the test. You can see others in a special booklet we've just prepared. (It's yours for the asking.) You'll also see the *reason* for our double win:



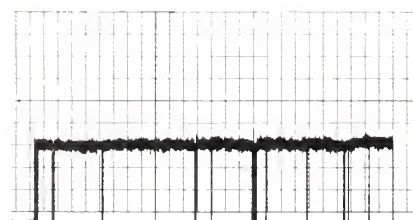
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Computer Products



Data Briefs

Modem Interface Splitter Can Handle Four Terminals

CHERRY HILL, N.J. — A modem interface splitter that allows a single modem to service up to four terminals, four computer ports or four separate processors, is available from Spectron Corp. Typical applications include elimination of multiple modems where several polled terminals are located or the connection of a standby processor to a modem operating with an on-line processor.

The \$315 Model 320 handles two terminals while the \$410 Model 340 services four terminals. The devices are available in 30 days from Spectron Corp. at 1060 Kings Highway N., 08034.

Intertel Shows Dial-Up Modem

BURLINGTON, Mass. — Intertel Inc. has an integral modem that provides automatic-answer operation at 2,400 bit/sec over the dial-up telephone network.

The Model 2012C is a four-phase differential phase shift keyed modem which offers higher-speed operation than the 2,000 bit/sec Bell 201A. When used with the firm's 150 bit/sec reverse channel, the 2012C is the only dial-up modem available with automatic answer and reverse channel other than the lower-speed Bell 202C, Intertel said.

The 2012C costs \$1,325 and is immediately available. Intertel is at 6 Vine Brook Park, 01803.

CRT Terminal Message-Oriented

PENNSAUKEN, N.J. — A CRT terminal for use in message entry, order entry and similar applications is available from Video Systems Corp.

The VST 1296 permits terminal/computer interaction under operator control when a 'specially formatted' message is ready for transmission. The VST 1296 has an RS-232 asynchronous serial interface that operates at 1,800 bit/sec. It also has a high-speed parallel interface operating at 1,800 char./sec which is used for local operation in a demand/response mode.

The VST 1296 displays 18 lines of data with 69 char./line for a total of 1,242 characters.

The device is priced at \$3,995. Options include multiple paging, built-in modems, page scroll-up and protect format. The firm is at 7300 N. Crescent Blvd., 08110.

Winder-Unwinder Unwound

MAHWAH, N.J. — A combination paper tape winder-unwinder that automatically stores tape on a reel for all Model 33 and 35 TTYs has been announced by Western Union Data Services Co.

It is also available for the EDT 300 Automatic Send and Receive, Data Services version of the GE Terminus 300.

The winder-unwinder stores paper tape on an 8-1/2 in. reel as it is being punched. When the tape is ready for transmission, it is removed from the winder assembly, placed on the unwinder and fed to the reader, inner end first so that the tape will be transmitted from the beginning.

The take-up reel has a 1,000-ft tape capacity and the unwinder can handle 700 ft of tape.

The monthly rental charge is \$6. The firm is at 82 McKee Drive, 07430.

Control Suited for Full Duplex Gear

JUPITER, Fla. — Logic Systems Corp. has the Model 2017D Motor Control specifically designed for full-duplex operation with the Model 33 ASR teletype-writer. The Model 2017D provides automatic ON/OFF control of the Model 33 ASR in both send and receive modes. The control is equipped with all necessary cabling and plugs for \$64. Logic Systems is at 1567 Cypress Drive, 33458.

Users Get DAA Alternative

Rochester Interconnection Approved

By Ronald A. Frank
Of the CW Staff

ALBANY, N.Y. — The New York Public Service Commission, in a precedent-making order, has approved the interconnection plan of the independent Rochester Telephone Corp. (RTC). The decision will allow RTC customers in the Rochester, N.Y., area to interconnect non-carrier and carrier modems and other devices with a Network Protective Device (NPD) instead of being restricted solely to the more familiar Data Access Arrangement (DAA) required by Bell System companies.

The Rochester interconnection plan, first proposed in February 1971, can now be initiated subject to approval of a new tariff filing. It is based on the use of the NPD together with an inspection/certification of customer-owned equipment. The Rochester proposal, described as a simplified interconnection method, was opposed by AT&T's New York Telephone Co. during lengthy hearings.

Major Advantages

The major advantages to users of the RTC interconnection plan are an initial rate of \$20 without additional monthly charges. Bell charges a monthly rate for the DAA. The NCP is called a simpler

interface than the DAA and, subject to RTC inspection and certification, more interconnected equipment will probably be compatible with the NPD system than with the DAA. An automatic loop-back feature on the NPD allows RTC to test lines without having to dispatch a repairman to the user's site.

The first customers to use the Rochester NPD have already received interconnection service under special assemblage (interim) agreements [CW, July 5].

One major change incorporated into the PSC decision was its order that carrier and non-carrier equipment can be connected to the subscriber's line. The Rochester proposal had specified that only customer-owned equipment could be used on NPD lines. RTC has said that a mixture of equipment would make it difficult to isolate problems.

The commission said this argument was not convincing and added that "tracing difficulties to one among many pieces of equipment is the everyday task of the [telephone] repairman."

The PSC also said RTC should offer Bell-type DAAs of the most popular versions.

In this regard the commission ordered RTC to offer nine types of Bell devices, or their equivalents, including the CDT,

CBS and CBT units used by AT&T for data interconnection. This provision will make RTC customers the first in the country to have a choice of interconnection methods.

The PSC rejected objections by the New York Telephone Co., a Bell System affiliate, with regard to the inspection and certification methods proposed by RTC. The PSC said New York Telephone has objected only in "nonspecific terms," and it ordered RTC to file specific inspection and certification procedures in the final tariff.

The commission disagreed with RTC's original proposal that computers with automatic "call regenerating capability" should not be interconnected with Rochester facilities. While recognizing that such CPUs "can, under some conditions, preempt a disproportionate share of central office facilities," the PSC said such installations should be made on a negotiated basis. It cautioned RTC not to "withhold access to computers unreasonably."

In approving the basic proposed charges filed by RTC, the commission said interconnection should be offered to flat-rate customers at the same rates as for full service. Rochester has said interconnection should be limited to message-rate subscribers only.

"The PSC decision said the interconnection will result in freer competition so subscribers can have a wider choice of equipment. The use of non-carrier equipment will also be less costly, especially for users who install equipment 'less elaborate than that provided by the telephone company,' the commission added.

New Responsibility

The user will face a new responsibility with interconnected equipment, the commission said. "Interconnection will give the user responsibility for the repair and maintenance of his non-carrier equipment. Such service will probably be provided by non-regulated suppliers over which the commission has no control, the PSC said.

But despite the drawbacks and lack of broad experience with interconnection, the commission said it favored the RTC plan, and would continue to observe the results "with care."

The PSC decision was made in a 3 to 1 vote. In his dissenting opinion, Commissioner Edward P. Larkin commented that "it is absolutely inconceivable that the RTC proposal can be of any financial benefit to subscribers of the company."

DEC Graphics Terminal Links PDP-11/40 to Host Processors

MAYNARD, Mass. — An intelligent graphics terminal with light pen, Ascii keyboard and serial communications interface has been introduced by Digital Equipment Corp.

Called the GT40, the terminal contains a PDP-11/40, 4K mini and can be used as a remote terminal interacting with various host CPUs or as a stand-alone graphics system. Software is available to interface the GT40 to the Decsystem 10 and other Digital machines, but software for most Ascii CPUs would be easy to write, a spokesman said.

The GT40 communications controller allows asynchronous transmission between terminal and host CPU at speeds up to 9,600 bit/sec. Interfaces for EIA, TTY current loop or data sets are available with the system.

The hardwired display processor within the GT40 performs most of the graphics control functions. The processor fetches

and executes its own instructions and data direct from memory, thereby minimizing the processor overhead of the host CPU, DEC said.

Characters are hardware drawn and include 96 upper- and lower-case Ascii, 31 special characters such as Greek letters, APL symbols, control characters and italics. The CRT screen can accommodate 31 lines of 80 characters.

Vectors are hardware drawn with a constant velocity technique. Programming modes include character, long and short vector, point and relative point mode and X/Y graph plot. Eight intensity levels are available as well as a blink feature.

A GT40 system including a 4K mini with 4K core, display processor, keyboard, light pen, serial communications controller and display subroutines costs about \$10,900. First deliveries are scheduled for November.

Tymnet, Arpa to Link

WASHINGTON, D.C. — Plans are being made for an experimental interconnection between the commercial Tymnet time-sharing network operated by Tymshare Inc. and the government's Advanced Research Projects Agency (Arpa) network now connecting universities and research installations. Other commercial time-sharing nets may also be connected to Arpa experimentally.

The inter-network links will be made for demonstration purposes at the International Conference on Computer Communication to be held here Oct. 24-26.

To connect the two networks, a Tymnet-modified Varian 620 minicomputer has been interfaced with a Honeywell 416 TIP processor in the Arpa net. Attendees at the ICCC will be able to access data bases on either of the two communications nets.

Information about the ICCC is available from Harry Hayman, Box 639, Silver Spring, Md.

Microprocessor-Driven CRT System Can Be User-Customized

HACKENSACK, N.J. — A customized microprocessor-driven CRT display system is available from SYS Computer Corp.

Using a terminal check list generated by the customer, SYS can provide a CRT system controlled by a CPU that may be programmed through the use of "instant firmware."

The firmware feature allows programs written to the user's specifications to be "burned" into programmable read-only memories (Prom). The Proms are then incorporated into standard circuit boards which can be plugged into the system in the field.

The SYS system can support up to 32 CRTs which can display up to 1,920 characters each. All character shapes and styles are available including foreign accent marks; character sets up to 256 symbols can be custom-configured as required by the user.

Keyboard layouts, cursor controls, editing and paging functions can all be spelled out by the user, according to SYS. Interfaces with most peripherals and CPUs can be included with the system.

SYS has interfaced the CRT system with the Burroughs 5500, IBM 360/370, Varian 620, SEL 810 and others, a spokesman said.

Available communications options include Ascii, EBCDIC, Selectric and other code sets. The system can be configured for stand-alone or cluster operations.

A typical system with a 5K-byte CPU and two 960-character displays costs about \$4,000, a spokesman said. In larger configurations, the system costs about \$1,750/terminal depending on options. Despite the customizing, a system can be delivered about 90 days after the check-list is completed, the company said. SYS is at 17-25 DeCarolis Court, 07601.

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No Waiting for Perfect System

'Familiar' Mini Modified for Business

By a CW Staff Writer

BINGHAMTON, N.Y. Waiting until a system is "absolutely perfect" could mean never getting a system up at all, according to a small user who turned a production computer into a business machine.

A turnkey system provided by a vendor but later modified "to suit our needs," without hiring and training a large staff, was the goal of the Gannett Newspapers, according to Joseph P. Junker, manager of corporate systems.

Users should remain aware that learning curves impact turnkey systems, and not just total in-house-developed facilities, he indicated.

Gannett's DEC PDP-8 had been used only for hyphenating and justifying type for input to composition units, Junker said. He emphasized the machine "is a general-purpose, programmable computer rather than a special purpose, hard-wired typesetting computer."

When DEC introduced its Dilog language, the newspaper chain could program business and accounting applications, Junker said in the June issue of *American Press* magazine.

A key point in the transition, he said, was that

the newspaper people already felt comfortable with the computer, because of its previous use in typesetting. Since most of the Gannett papers have circulations between 24,000 and 150,000, he added, they were too small to afford a large mainframe system.

A design objective was that the system could be

The Small Systems User

"managed and operated at a newspaper location... without having to hire and train a large staff," he said.

While circulation applications would be the maximum payoff, the conversion was started with payroll because it was an "easier way of getting over the learning curve."

While the accounting department had sole responsibility over payroll, he explained, the circulation system would cross departmental lines, bringing in the sticky problem of coordination.

During the first several months of implementation, about two years ago, the system was being changed "on an almost daily basis," Junker related.

The changes could not be anticipated, he said, because "we simply did not bring everybody into the picture to start with." The company could not afford the time, he explained.

"If we had decided that we weren't going to go with the system until it was absolutely perfect," he added, "we may never have gotten the system up at all."

This aspect of implementation is not new, he said, because "most business decisions are made on only partial information."

User 'Branches Out,' DP Monitors Costs

LIVERMORE, Calif. — A company that is truly "branching out" is using a small computer to control costs of labor and equipment, with transfers of work crews and maintenance of vehicles the prime applications.

The West Coast division of Davey Tree Surgery Co. uses its small system to monitor operations from the Rocky Mountains to Hawaii. Besides tree care and landscaping, the company's crews clear branches over utility rights-of-way.

Job Assignments

With crews spread out so widely, the computer is used to compare men and equipment assigned to certain jobs against the contracted fee for the work, according to E.W. Haupt, vice-president and general manager for the West Coast operation.

The computer, an IBM S/3, helps Haupt determine, for example, if part of a San Diego-based crew should be transferred to Los Angeles, where a workload might be heavier, or if a special piece of heavy equipment in Phoenix would find more use in Portland, Ore.

"The computer has allowed us to know exactly how much each of our 350 vehicles is costing us every month," Haupt related, with the cost items including gasoline, oil, maintenance and depreciation.

By closely monitoring these figures, Haupt said, it is easier to say which pieces of equipment aren't worth keeping, or to pinpoint a vehicle that is not being used enough to justify its cost and upkeep.

"To us, an idle piece of equipment is an out-and-out loss," he commented.

The West Coast operation also has programmed its system to break the division into 13 sub-districts, treating each as a separate company. If a division is not making money, this is highlighted, and adjustments to work schedules, equipment or other factors can be made, to "put it back into the black," the vice-president said.

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Bits & Pieces

Data 100 Terminal Suited For Remote Communications

MINNEAPOLIS — A low-cost version of the Model 88 data entry terminal from Data 100 Corp. provides users with key-punch-type data entry and IBM 2780 communications capabilities at remote locations.

The Model 88-21 Keyboard Terminal, designed for low-volume applications, consists of a stored program control unit, push-button selectable in Entry or Communications mode; a Comfile storage drive and cartridge with an expandable 600 card image capacity; a Selectric type-writer and an auxiliary 10-key numeric keyboard.

The terminal transmits EBCDIC code at 2,400 bit/sec and can communicate with any system supporting IBM 2780 communications.

Lease price of the Model 88-21 terminal is \$395/mo from the firm at 7725 Washington Ave. S., 55435.

Tape Transport IBM-Compatible

HICKSVILLE, N.Y. — The D-600 tape transport from Per Data offers users a variety of tape speeds and packing densities.

The D-600 is IBM-compatible and is available with standard speeds of 25, 37.5, 45 and 75 in./sec, and packing densities of 556 or 800 bit/in., 7- or 9-track read-after-write configurations. Read-only operation may also be specified.

The unit, including controllers and software, costs \$3,995. Optional 1,600 bit/in. packing density is an additional \$900.

Delivery is 30 days from 102 New South Road, 11801.

Expander Controls I/O Devices

FT. LAUDERDALE, Fla. — Independent peripherals from Computer Products, Inc. (CPI) can now be used on the Modcomp series of minicomputers, as a result of the I/O Expander from CPI.

The new unit sells for \$2,000, and it interfaces the "entire array" of CPI analog and digital I/O equipment in its Real Time Peripheral line to the Modcomps.

CPI can be reached through P.O. Box 23849, 33307.

Shorter Pieces

Acco International, Inc., Chicago, has a Roll-a-round unit for printout storage combined with a table top for writing and reference. The complete workstation costs \$118.95.

A brochure describing the proper operating techniques for computer printer ribbons made of mylar polyester film is free from DuPont Co., Wilmington, Del.

Auerbach Publishers Inc. has a special report on IBM's 370 virtual memory systems for \$25.

2305 Needed?

3330 Could Be Too Slow for Paging

By Ronald F. Frank

Of the CW Staff

CAMBRIDGE, Mass. — Intel's recent introduction of a controller to handle both a 3330-type disk and a fixed-head 2305-type device gives users an important solution to a serious problem that may hamper IBM virtual storage users.

The possibility of system degradation when a moving-head device such as the 3330 is used seems very real to experienced virtual users and industry experts. The logical alternative may be a shift to a faster fixed-head device. And the Intel controller, which swings both ways, could provide an effective hedge for users planning to grow into their virtual systems.

"The 3330 is inadequate for extended page storage in larger on-line virtual systems," according to John Thron, president of Computer System Architects Inc. But when the user's virtual system begins to show degraded performance, Thron sees several alternatives for the user.

Main Memory Storage

The first that will probably be stressed by IBM is the addition of main memory storage. This will reduce the page faulting to some degree but may not be the best, or the least costly, solution for the user, Thron said. The second logical alternative involves the addition of a faster virtual storage device such as the 2305 or an independent equivalent, Thron said.

Decsystem 10 Prices Reduced, Software and Controller Added

MAYNARD, Mass. — In addition to reducing prices on its Decsystem 10 from 15% to 33%, Digital Equipment Corp. also announced a new configuration, the 1060, unveiled two software packages and an intelligent terminal controller for teletypewriters for the Decsystem 10.

The 1060 configuration includes the faster KI-10 processor which eliminates the swapping drum. A 64K system with peripherals and communications capability costs \$528,000.

The price reductions range across the six models of the Decsystem 10 line. The reductions were based in part on the MF10 core memory which gives the KI-10 a faster throughput rate under heavy processing loads, DEC said. The MF-10 has a 550-nsec access time and can be expanded to 1,024 words. The MF-10 costs \$80,000 for 64K words, or 60% less than previous core for the Decsystem 10.

New Upgrade Policy

Price reductions range from 27% for the 1040 with 64K to 35% for the 1077 with 128K. A new upgrade policy allows the

"The user has to dedicate a channel with a 3330 to supply extended page storage. And you can't really do this effectively with the 3330 system," he said. This would be wasting a lot of storage capability, he added.

The user could scatter the contents of

of times per second of CPU time can occur in programs that are 80K words long," said Ron Jeffries, vice-president for research and development at Com-Share Inc. And if users start writing 16M-byte programs, the average program is just not going to be localized in core," he said.

Com-Share has operated XDS virtual systems for some time, Jeffries said, and the firm relies almost entirely on fixed-head devices for its virtual storage.

Wrong Device?

"There is a very low probability that required pages will be accessed linearly," Jeffries said. And the very fact that the 3330 user may have to think in terms

(Continued on Page 22)

Analysis

the paging store among the spindles of the 3330. Infrequently used data could then be stored on the remainder of the 3330 system not used for paging. But this type of arrangement would be difficult to manage, according to Thron.

"We find that paging rates of hundreds

Telex 360/370 Printer Promises Large Savings Over IBM 1403 N1

TULSA, Okla. — Telex has a modified version of its earlier printer system that is compatible with the IBM 1403 N1 for use with 360 and 370 systems, at considerable savings.

The 6721 Telex printer with its built-in controller can operate on either multiplexer or selector channel. The 6721 uses the same horizontally stable train-printing

method as the 1403 N1 with improved print quality, the company said.

The 6721 has a print speed of 1,200 line/min, plus faster skip speeds than the 1403 N1, when operating with a 48-character print set, Telex said. In this configuration, the printer provides about 10% more throughput than the IBM unit, the company said.

Easier Loading

Telex innovations include easier loading with full opening (1,800) tractors and faster, easier forms positioning; verification printout of type array contents, printer operability signal and forms alignment checking by way of push-button operator controls; and indicators signaling top-of-forms and unlatched train gate incorporated into the display panel. Automatic retry within the printer itself checks out transient errors.

Continuous printing speeds of 1,500 line/min are possible with the Telex 36-character set. Under automatic control a speed of 2,500 line/min can be achieved in burst mode for several minutes using 16-character sets.

When used with 360s and 370s, the 6721 costs \$1,065/mo on a two-year lease compared with an IBM price for the 1403 N1 of \$1,731, according to Telex. On a purchase basis the IBM printer costs \$77,390 while the Telex replacement is priced at \$42,270.

The 6721 can also be used to replace the Integrated Printing Adapter on the 370/135, Telex said. On a two-year lease, the IBM 135 IPA system costs \$1,228/mo while the Telex price is the same for other two-year configurations for a savings of about 13%, according to Telex.

Deliveries of the 6721 will begin in February 1973 with unlimited usage and maintenance included in the quoted costs.

At \$3,200 the 1030 TELETERM® is a steal. (Light and portable, a fast getaway is a cinch).

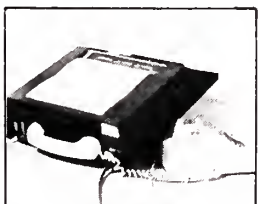
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IBM 2260 Replacement

One System IV/70 can replace up to four IBM 2260/2848 Display Systems with *typical monthly savings from 40% to 60% on a 1-year lease.*

- ☐ Field proven simulation of all standard and optional 2260/2848 features with both local and remote 360's and 370's
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- ☐ Adding Machine Mode enables terminals to double as desk calculators
- ☐ Independent Supervisory Mode for inter-terminal communications and training
- ☐ Small CPU requires only 800 watts and operates in normal office environment
- ☐ Easily upgradable to other intelligent terminal applications such as . . .

IBM 3270 Replacement

System IV/70 can simulate both local and remote IBM 3270 Display Systems with *typical monthly savings from 20% to 40% on a 1-year lease.*

- ☐ Simulates all functions of 3270 Models with easy conversion from IBM 2260/2848 simulation
- ☐ Supports IBM features of BSC remote communications, Dual Intensity, Audible Alarm, and Selector Light Pen
- ☐ Improves communications efficiency through format control by data field, character addressing, data compression, and exception transmission
- ☐ Accommodates extensions for local format storage and retrieval, single-key message generation, real-time data editing, and local disc fallback during central system down time

The New

High speed, 132 column Line Printer.

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Data Entry and RJE

For shared processor data entry with magnetic tape output, System IV/70 can be operated with all editing and validation features for *less than \$100 per terminal per month on a 1-year lease.*

- ☐ Provides all functions of IBM keypunch and key verifier plus real-time character-by-character editing and validation features that significantly reduce 360/370 preprocessing
- ☐ Combines multiterminal data entry system with functions of IBM 2780 Remote Batch Terminal
- ☐ Displays full length records of up to 750 characters in fill-in-the-blanks formats that resemble source documents
- ☐ Supports conditional field checking, data reformatting, and hard copy output of screen images, data files, and operator statistics
- ☐ Outputs data to magnetic tape, bi-sync communications with 2780 protocol, or local IBM Channel
- ☐ Receives and stores 360/370 reports in unattended mode for CRT access and hard copy output

COBOL Front-End Processing

For branch office distributed computing applications, System IV/70 can be configured with COBOL and a 72K byte CPU, 50 million byte disc drive, printer, bi-sync communications, and six 1920-character CRT's with dual intensity and audible alarm for *less than \$2000 per month on a 1-year lease.*

- ☐ Enables custom COBOL programs to be written easily for both batch and interactive applications
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- ☐ Supports ISAM file organization for efficient data base management
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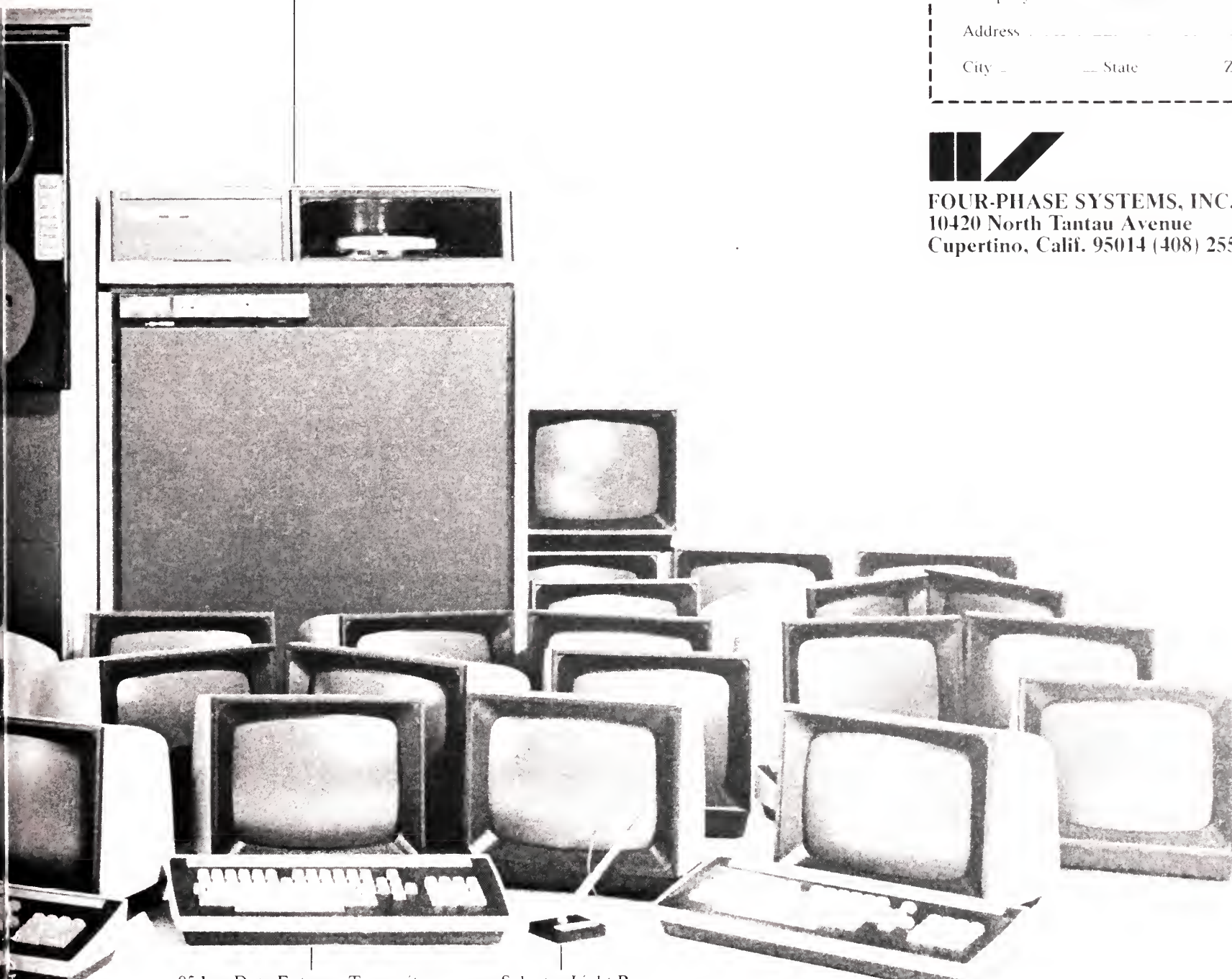
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| IBM SYSTEM TYPE | TELEX SYSTEM TYPE | IBM* RENTAL | 352 HRS. OVERTIME | TOTAL IBM MONTHLY RENT | TOTAL** TELEX MONTHLY RENT | TELEX MONTHLY SAVINGS | TELEX ANNUAL SAVINGS | % SAVINGS |
|---|--|-------------|-------------------|------------------------|----------------------------|-----------------------|----------------------|-----------|
| 370-135 3135 GF with 8-3420-5 tapes, 6-3330 disk and 2-1403N1 printers and appropriate controllers or adapters | 370-135 3135 GF with 8-6420-5 tapes, 6-6316 disks, 2-5403 printers and appropriate controllers | \$ 20,551 | 1,686 | \$ 22,237 | \$ 16,369 | \$ 5,868 | \$ 70,416 | 26% |
| 370-145 3145 I with 8-3420-5 tapes, 8-3330 disks, 2-1403N1 printers and appropriate controllers or adapters and memory | 370-145 3145 I with 256K Telex memory, 8-6420-5 tapes, 8-6316 disks, 2-5403 printers and appropriate controllers | 34,334 | 4,318 | 38,652 | 26,846 | 11,806 | 141,672 | 31% |
| 370-158 3158 J with 16-3420-5 tapes, 24-3330 disks, 2-1403N1 printers and appropriate controllers and adapters and memory | 370-155 3155 J with Telex memory, 16-6420-5 tapes, 24-6316 disks, 2-5403 printers and appropriate controllers | 64,942 | 7,270 | 72,212 | 50,492 | 21,720 | 260,640 | 30% |
| 370-168 3168 K with 16-3420-5 tapes, 24-3330 disks, 2-1403N1 printers and appropriate controllers, adapters and memory | 370-165 3165 K with Telex memory, 16-6420-5 tapes, 24-6316 disks, 2-5403 printers and appropriate controllers | 108,682 | 16,018 | 124,700 | 92,278 | 32,422 | 389,064 | 26% |

*Includes IBM's Fixed Term Rental Plan, Extended Term Plan, as well as the use of the newly-announced price modifications — Integrated Storage Control, Integrated File Adapter, the 3830-2, the 3333

**Both the Telex and IBM prices include Virtual Storage and Dynamic Address Translation (DAT).

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System Degradation May Result With 3330

(Continued from Page 19)

of selectively storing his data is an indication that he is using the wrong device, he added. "The user shouldn't have to do specific address allocation in order to have an efficient operating system."

But given the fact that many users will be operating with moving-head devices, Jeffries said some software help to make the virtual storage devices run more efficiently is a good possibility.

"Optimizing loaders and compilers that take into account the larger memory of virtual systems and will allocate programs in such a way that they minimize usage" will probably be introduced by IBM and the independents, he said.

"The operating system is in a position to know what the paging characteristics are. It can keep real-time data during test runs and then reallocate storage, or, in the case of the 3330, reallocate the order of data on the spindles," Jeffries added.

The Problems

The exact point at which a 3330 system will become a problem depends on several variables. "The access time will be a problem. Actually the transport time, which is the sum of the access time and the data transfer time for a page, will be the key factor in system degradation," he said. For the 3330 the transport time will be about 45 msec, he estimated. Transport time on the 2305 would be about 4.5 msec.

The transfer rate on the 3330 is about .8 Mbyte while it can be as high as 3 Mbytes on the 2305-1, he said. In any case the ratio of these transfers rates and transport time on moving versus fixed-head storage devices will be critical for the virtual user.

For an ITEL user, the shift to 2305-type storage will pose little problem. He will merely add the 7305 (ITel's version of the 2305) to his existing controller. But for

the IBM user, a new controller with considerable additional expenditure could be involved.

Other suppliers will probably offer 2305 replacements to the user, and other technologies may also be used. A spokesman for Vermont Research, an OEM drum supplier, said current models which operate up to 7,200 rpm with 4.3 msec access time for a 2M byte device could be an important alternative.

But one independent spokesman discounted the drum idea. IBM is setting the pace with fixed-head disks, and a return to drum technology is unlikely, he said.

Vendors Confident

Most of the independent peripheral vendors apparently feel the 3330-type system, perhaps in an expanded mode, will adequately serve the IBM virtual user for the present. A spokesman for Telex said the firm's announced capability to handle 16 spindles on its 3830-type controller, thereby matching the capacities of the IBM 3830-2, would help users. Memorex also is planning to double the capacity of its 3330-type controller along with ITEL.

An IBM spokesman said the 3330 usage depends on specific virtual storage configurations. "One large system user may find the 2305 best suited to his needs while another will prefer the 3330," an IBM spokesman said.

The factors that will determine the choice include CPU power, real storage size, system configuration, user applications and their paging rates, virtual storage size, the ability of the user to spread external page storage over multiple devices and cost, IBM said.

It may be possible for the virtual user to live with his 3330 system even when paging problems occur. But users planning to install virtual systems should check on the operating characteristics that can be expected from their disks.

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DP Tracks Show Dates, Aid Management

Film-Rental System Solves Its Booking With a Bonus

By Thomas H. Boardman
Special to Computerworld

CHAMPAIGN, Ill. — The University of Illinois at Champaign is a long way from Hollywood or New York, yet it ranks as a major motion picture distribution center. The Visual Aids Service uses a computerized system to keep track of booked and available show dates for over 10,000 titles and 26,000 prints in its rental service library. But the system offers a bonus too — detailed management reports. Last year it supplied films for more than 150,000 exhibitor showings around the nation. This year it expects film shipments to reach 165,000.

Customer inquiries about film and show date openings are answered in seconds. Rental orders are confirmed, or denied because of schedule conflict, in days instead of weeks. Pertinent information — running time, cost and rental rate, age and producer source — is instantly available. This includes day-by-day "booked" or "open" status for 18 months ahead.

Visual Aids Service is a non-profit organization, funded by the University of Illinois, that recovers its budget by charging users a nominal fee.

It operates from its own facilities on the university campus, and functions as a national resource center for educational, instructional, travel and documentary films of every description.

It deals primarily with schools, at every level from kindergarten through adult education. It also rents films to business organizations and labor unions, government bodies, civic, social and fraternal groups.

Under former procedures, the big problem, compounded by rapid increase in rental volume and steady growth in the number of films and titles, was the scheduling of bookings. Delays of six to eight weeks — and even longer — in confirming or denying availability to fill customer requests were common. This proved to be a serious bottleneck.

Now the new system, which uses three IBM 2260 CRT terminals at the headquarters, on-line to a System 360/50 at the university's administrative data center, has broken the bottleneck.

Faster service, with an average turnaround of two days, has been achieved with no increase in the number of clerical personnel, and with a considerable reduction in overtime costs.

In addition to expediting written response to written orders, the CRT terminals are also used to answer a steady stream of telephone inquiries from potential customers. Clerks at these terminals call out screen displays of film availability dates, title descriptions, rental rates, running times and other information, in order to answer questions.

Although the chief gain from the new system has been in customer service, there have been many important bonus benefits. The computer automates rental billings, for example, eliminating much paperwork and speeding up cash flow.

It furnishes all statistical and financial data needed for periodic reports to the dean's office. And it gives Visual Aids Service management a wealth of vital control information, such as current film age, inventory valuations, rental demand patterns by film title and subject matter (space, ecology and environment currently lead in popularity), and rental activity by individual customer and by customer classifications.

The three CRT terminals give the organization's personnel instant access to the key master file in the data base.

This key file, which is called the "Film Availability" master, is stored on a magnetic disk and is always accessible to terminal inquiry. Included on this file is a record which includes, for each film, the full title, a unique, 5-digit film identity code, the rental rate, running time in minutes and the number of black and

white and/or color prints in the library.

Most important is the information referred to as the "booking matrix." This gives the "booked" or "open" status for each print of the film title for 18 months into the future, sectionalized into monthly segments and broken down by week and by day.

The Film Inventory master — which is off-line and thus not open to terminal inquiry — is another file essential to effective library control and management.

This master file contains data about the film's cost (purchase price), its acquired date, production date and source, along with the identity code and title description, rental rate, running time and print status.

A third master file which completes the data base is also off-line. This is the Customer Master, used in the billing routine and in the accumulation of customer rental activity statistics.

It contains the customer's name, a

5-digit identity number, shipping and billing addresses, customer-specified billing mode and a class code (one of seven different customer categories).

Each order goes first to a customer clerk, who enters the customer identity number, along with other information, on a keypunch form. The original order document and the keypunch form then go to one of the booking clerks, who uses the visual display terminal at the workstation to verify film codes and titles.

This fast verification has meant greatly improved accuracy in rental operations. The system rejects any invalid, or non-existent code.

After verification, the booking clerk enters the rental request data and forwards the form to the keypunch department, where a card is produced for each film requested. Two or three times a week, these orders are batched and sent over to the administrative data center for processing by the computer.

The first step is to update the master files in the data base — the Customer Master to reflect new rental transactions, the booking matrix on the Film Availability master to reflect new booked dates (provided those dates were open) and the Film Inventory master to reflect any changes in library status for the period — titles or prints added or deleted, rental rate adjusted, etc.

Following the file update, the computer processes the rental orders.

At programmed intervals, the computer also produces a variety of control and management reports. These include library inventory status, film age and valuation summaries, analyses of film demand by title and subject matter, and analyses of customer activity by individual and classification.

T.H. Boardman is director, Visual Aids Service, Extension Division, University of Illinois.



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Communications Man of Year to Be Named

WILMINGTON, Del. — Balloting is under way for the 1972 "communications professional of the year," and the sponsoring organization, the Communications Systems Management Association (CSMA), will announce the winner later this month.

Presentation of the award will highlight the National Communications Week Convention planned by CSMA for Sept. 25-29 at the Playboy Towers Hotel, Chicago.

The winner will become a lifetime member of the association, and will have a scholarship given in his name to a "deserving student pursuing a career in the communica-

tions field," CSMA said.

The group has also invited several company presidents to participate in a "closed door"

Societies/User Groups

meeting with "the chief executives of the major communications carriers," who will discuss the future of communications and how it will affect businesses.

Although all carriers have not yet appointed speakers, CSMA expects participa-

tion from United Utilities Inc., AT&T, MCI, Western Union, Western Telecommunications Inc., and General Electric.

The association was formed in 1970 and, while it currently maintains an eastern orientation, it plans to have a West Coast chapter operating this fall, officials said.

On Tuesday, Sept. 26, attendees will receive an "update on the interconnection issue," CSMA reported. The theme of the session will focus on what communications systems are presently available, and what they can offer the users, CSMA noted.

Facilities, services and equipment for voice, data and signal transmission will be included.

Attendees will also have a chance to attend workshops on Tuesday to Thursday, with the topics including educational applications, interconnection analysis, modem selection, basic design and hybrid communications systems concepts.

Price is set at \$25 for members, \$30 for non-members, plus special activities (cocktail parties and dinners). Other information is available from CSMA, Suite 1001, 1102 W. St., 19801.

Users, Industry Set Busy Schedule

GAITHERSBURG, Md. — Measurement and management provide the theme for the third annual technical symposium of the Special Interest Group on Computer Installation Management, a sub-group of the Association for Computing Machinery.

Scheduled for Oct. 17-18 at the National Bureau of Standards here, the symposium will feature program sessions on three subjects: performance measurement, management of remote access systems and programming management.

The meeting is just one event in a busy October schedule. Information is available from Bruce Ransey at NBS, P.O. Box 732, 20760.

Other October Events

Oct. 3-5, New York — Input/Output Systems Seminar '72 sponsored by the Data Processing Supplies Association. Contact: C.A. Greathouse, Executive Director, Data Processing Supplies Association, P.O. Box 1333, Stamford, Conn. 06904.

Oct. 9-12, Washington, D.C. — 1972 International Conference on Cybernetics and Society sponsored by the IEEE

Calendar

Systems, Man and Cybernetics Group and the American Society for Cybernetics. Contact: Professor K.S. Narendra, IEEE Conference Chairman, Becton Center, Yale University, New Haven, Conn. 06520.

Oct. 10-12, Toronto, Canada — Fall Meeting of the Univac Users Association. Contact: C.J. Rachel, Executive Secretary, UUA, Univac Division, Sperry Rand Corp., P.O. Box 500, Blue Bell, Pa. 19422.

Oct. 23-26, Lake Geneva, Wis. — The 11th Annual Meeting of Users of Automatic Information Display Equipment (Uaide), "Cost Objective Management." Contact: Uaide, P.O. Box 2449, San Diego, Calif. 92112.

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After you install a minimum 370/STOR module, we can expand it up to an additional 1.75 megabytes by simply plugging cards into your installed unit. As a rule of thumb, figure that we can add about 512K bytes in about two hours. It's as easy as opening two cabinet doors. No other memory has such a feature.

FACT #4. NO COSTLY CENTRAL PROCESSOR MODIFICATIONS.

To add IBM memory to your Model 155 requires processor modifications. These cost from \$12,000 to \$125,000, depending upon the number of "ports" your memory uses. 370/STOR uses only one port per two megabytes, so there is absolutely no requirement for processor upgrade. That alone can be a huge savings. No one else offers such a feature.

FACT #5. WE'LL GUARANTEE 72-HOUR EXPANSION.

Once you install a 370/STOR memory, we will upgrade it within 72 hours after contract approval if you desire. Our experience as one of the largest suppliers of add-on core for System 360 taught us that when a user wants more memory, he wants it fast. And let's face it, we want to make a point: no one else could possibly offer such a service.

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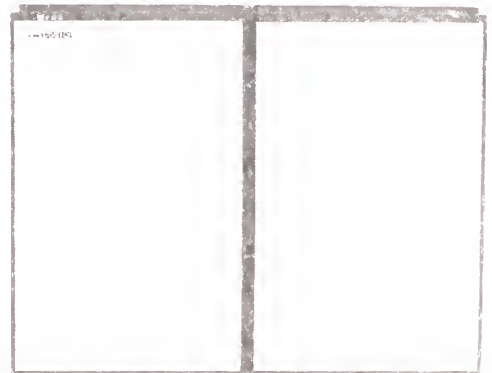
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Conference Hoping to Find Its Utopia With Game

LOS ANGELES — Frustrated with the state of society and want to change it? Attendees at a conference at California State University, Los Angeles, will have the opportunity to plan the quality of life of a community of 100,000 persons.

At the forthcoming "Focus: Shelters for Mankind" conference participants will play a computer "game" of community planning.

The game, played with four persons, is divided into seven

sections representing the key elements of a community: publicly supported services, economic environment, home environment, leisure, transportation, administration and revenue.

The players are given a basic physical area of 12 square miles that is land-locked. It has a water electrical system based on a river, canal and fountains, which can also be used for recreational purposes.

Each of the four decision

makers contributes suggestions as to what should be done and then the choices are discussed via computer terminals as they try to reach agreement.

Finally, the computer will digest all the choices and determine a fair and representative consensus. At the same time, it will keep track of individual decisions and also recap the plans as the players go along.

When the game is finished, the computer will come up with a visual display of the ideal com-

munity that was created, so the participants can see the end result of their utopia.

The purpose of the conference, to be held Sept. 22-24, is to bring authorities on architecture, urban planning, behavioral sciences and anthropology together with a concerned community so they can analyze and exchange ideas about the use of alternative structures for housing and industry.



Pollution Ills Shown

WASHINGTON, D.C. — A photo-documentary exhibit here on what environmental pollution is doing to America is now available to the public through publications, television stations, and schools with the aid of a computer retrieval system.

The Environmental Protection Agency has devised the system to handle the photographic collection.

Security

The arcade of the DP center of the Southern Arizona Bank and Trust, Tucson, Ariz., is lined with 17 sheets of General Electric's MR-4000 mar-resistant sheet. Lexan sheet, said to be virtually unbreakable, provides greater protection from possible vandalism.

New Datapro 70 Report

VIRTUAL STORAGE AND THE NEW IBM 370's

IBM recently announced two new models of the System/370 computer series, the 158 and 168; virtual storage enhancements for models 135, 145 155 and 165; four new virtual storage operating systems, and several new system approaches with serious implications for suppliers of independent disk drives and main memories.

DATAPRO's brand new 38-page report, "The IBM System/370," explains and analyzes all of these developments, and also presents complete specifications, pricing and evaluation of all components, features and software in the entire System/370 line.

IBM feels that the 370/virtual storage announcement "may ultimately be judged to be among the most significant in the history of our industry." DATAPRO reveals its real significance and puts the announcement into proper perspective.

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CI Notes

Data Entry Units Planned

NORRISTOWN, Pa. — Two firms will soon be announcing mixed or multimedia data entry systems combining OCR with keyboard entry techniques.

Scan Data, which is entrenched in the OCR side, will add key-to-disk stations to one of its OCR readers, while General Computer Systems is expected to add OCR capability to its key-to-disk system as well as improve the systems communications capability.

GTE Enters Leasing Area

WHITE PLAINS, N.Y. — GTE Information Systems Inc. has formed a new subsidiary, GTE Leasing Corp., to provide consolidated leasing services for the data communications systems and products offered by the company.

Leonard A. Muller, president of GTE Information Systems, said the chief advantage of the new leasing organization is that "it assures our customers direct contact with a GTE Information Systems subsidiary rather than with an outside third-party leasing company."

GTE Leasing Corp. will be responsible for leasing total data communications systems and products of the various operating units within GTE Information Systems.

Supershorts

Interdata will be taking a traveling road show to over 100 major OEM customers this winter.

Irving R. Schwartz has formed a new marketing organization to supply sales representation, field service and systems engineering for manufacturers of computer products, instrumentation and process controls. The I.R. Schwartz & Co. initially will focus on servicing East Coast markets.

The Association of Data Processing Service Organizations, Inc. (Adapso) will hold its 36th Management Conference and 12th Annual Meeting at the St. Francis Hotel in San Francisco on Oct. 26-27. The theme for the meeting will be "Improving Profits For the Computer Services Industry."

Pacific Micronetics, Inc. has made first deliveries on a signed agreement with Systems Engineering Laboratories to supply the PMI Series 100 Disk Storage Systems.

The Sociedad Mexicana de Computacion Electronica, A.C., (The Computing Society of Mexico), sponsor of the International Computer Exposition for Latin America, has appointed Seymour A. Robbins and Associates to manage the exposition and to handle all U.S. and European booth sales.

Memory Makers React

IBM VS Systems Could Open Markets

By a CW Staff Writer

LOS ANGELES — Memory makers are finding the IBM announcement of virtual storage and the 158 and 168 computers easier to live with than they had expected.

Or else they are just putting on a brave front in face of the new competition from IBM.

After studying the new IBM policies, "we don't think they will be as detrimental to the memory market as we first suspected," according to a spokesman for Ampex Computer Products Division.

"There will still be a huge market for add-on and replacement memory, probably larger than before," he added.

Each new IBM model "is a new business opportunity through which Data Recall hopes to realize additional revenue," Stuart Lotwin, Data Recall president, stated.

"In the context of the total IBM computer market," he added, "the new models 158 and 168 are directed toward a limited number of highly sophisticated users. Memory systems used to expand the IBM 360/65 and the 370/145 are considered the prime business opportunity for Data Recall during the next 18

to 24 months," he explained.

Still Confident

In addition, Lotwin said that "there are no technological innovations on the models 158 and 168 that would preclude the use of add-on memory from independent manufacturers."

"Data Recall," he added, "is presently planning the development of memory systems for the 370/135 and 145. Because the memory for the 158 and 168 appears to have reduced performance levels from the memory system for the 145, the technology used for independent 145 memory systems should be directly applicable to the 158 and 168."

Even though the new systems require 512K of resident memory, Lotwin said the total systems would probably have memories in the range of 1M or 2M byte/system. This will be the market for the independents, Lotwin indicated, estimating a 1.5 M-byte market per 158 and 168.

At Advanced Memory Systems, President Robert Lloyd said "the IBM announcement clearly endorses the aluminum-gate MOS solid-state technology for computer memories that we have been

shipping in large production volumes for over a year. Our existing devices being delivered in 370 add-ons meet all the performance requirements of the new memories announced by IBM."

In addition, AMS spokesman said the new virtual storage machines would increase the demand from the users for more memory and not less, thus creating an even larger market than is presently available.

In the past, they noted, "computer main memory needs have, for the average user, doubled every two years. Virtual memory is a more efficient use of the added memory many users will continue to need."

The new solid-state memories from IBM will make it harder for the makers of core memories to remain in competition, AMS said.

"Specifically, it is not technically practical to build a core memory add-on of the size and performance IBM is now configuring in solid state," the firm said.

'Not That Bad'

"Now that the announcement is public," another memory maker said, "we know what we are up against — and it's not that bad. It was worse before the announcement was made," he added.

"Users knew that IBM was due to come out with new products that might severely impact the memory market," he said, "so were leary of committing to new memory purchases. After all, what user wanted to be stuck with a product that might be made obsolete the next day?"

Most of the memory makers also said the prices set by IBM on products to be delivered in a year were high enough so the independents would be able to offer lower prices for compatible products.

In addition, the announcement of the 158 and 168 for delivery in nine to 12 months would give them, they felt, enough time to design products specifically aimed at those two machines.

Time to Adjust

The time between announcement and delivery, Lotwin said, "provides ample opportunity to further study the products and to make whatever technological and marketing adjustments the product may require from the standpoint of add-on memory."

Several of the manufacturers also said they expected no problems with IBM maintenance on the new systems.

"After the flair-up with the oversized 360/30s," one said, "we know how to design our replacements so that IBM will continue to maintain the CPUs. I don't think we will have any problems with the memories for the 158 and 168. In fact, they should be easier to design, especially since we now know the ground rules for replacement memory."

Computer Caravan Goes Abroad, Three European Circuits Planned

Companies experienced in European marketing and those new to that market should benefit from the three European computer caravans being sponsored next year by *Computerworld*, according to David Sudkin, consultant to the project.

The experienced firm could use the caravans much like domestic U.S. firms use CW's U.S. Caravan — to bring its products to local user areas where they would be exposed to regional users, he said.

For the inexperienced, however, the caravans should provide good initial exposure to the European scene, helping establish an image there, he added.

The European Caravan, which will be similar to the U.S. Computer Caravan run last year, will travel to three European areas: French speaking, English speaking and Germanic, Sudkin pointed out.

The first, which will run between May 1 and June 5, 1973, will go to Paris, Bordeaux, Marseilles, Lyon, Strasbourg and Brussels, constituting the French-speaking caravan. The price for the complete tour will be \$9,000.

The second caravan — the English-language caravan — will go to Stockholm, Oslo, Copenhagen, Amsterdam, Glasgow, Manchester and London, between Sept. 4 and Oct. 18. This caravan is priced at \$10,500.

The third caravan, the German-speaking one, will travel to Hamburg, Dusseldorf, Frankfurt, Stuttgart, Munich and Berlin between Oct. 23 and Dec. 6. It carries a price tag of \$9,000.

All together the three tours will bring exhibitors to local locations within 100 miles of 75% of the total number of computer users in Europe.

Exhibitors will come both from the ranks of domestic U.S. manufacturers and from manufacturers in foreign countries. Sudkin emphasized, even though he admitted that the U.S. firms would probably dominate the exhibit area.

Heavy Promotion

Promotion for the caravan will be heavy, Sudkin said, and will draw heavily on the international data file maintained by International Data Corp., parent of CW.

This file, he noted, lists most of the computer installations in Europe, all of which will be mailed promotional pieces on the upcoming tours.

He also noted that IDC has maintained a European operation since 1969, and that the caravans will be promoted heavily in publications in the different countries.

The format for the European caravans would closely parallel that of the U.S. operations, he added.

(Continued on Page 30)

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European Caravans Offer Exposure to Three Markets

(Continued from Page 29)

The mornings, he said, will be devoted to seminars and workshops on subjects of interest to the local users, with the exhibits open for their inspection in the afternoons.

The Europeans should be ready for the basic idea behind the caravan — a selling show brought to the local level, Sudkin said.

'Ready to Buy'

Europeans are not used to the circus atmosphere that is common at many U.S. shows," he predicted. "They go to a show to look at equipment and are ready

to buy. European trade shows are traditionally more sales oriented than those in the U.S.," he added.

But at the same time, Sudkin said that the European users were more regionalized than U.S. users and therefore more in need of the local selling approach.

"The European user does not like to travel halfway across the country for a trade show, he indicated. He is interested in seeing a local company or one with local representation in his particular area, Sudkin said.

"Today," he added, "they have been primarily served by huge trade fairs or smaller Department of Commerce exhibitions,

European Market Seen Spending \$6 Billion in '73

The three computer caravans planned for Europe will cover a market that is expected to spend \$4 billion that year on DP equipment, according to Patrick J. McGovern, publisher of *Computerworld*, which is sponsoring the events.

Overall, he estimated that the European market would spend around \$6 billion next year, with at least \$4 billion being spent directly by the local user in the selected areas covered by the three traveling trade shows.

In addition, McGovern noted that the European market was expected to grow at around 20% annually through 1975, outpacing the growth expected in the domestic computer market by a few points.

McGovern also pointed out that the European computer users will spend approximately \$6 billion more just to reach the level of their U.S. compatriots.

Because of this, he said that much of the market in Europe for U.S. computer equipment makers "will come from firms who presently have equipment installed."

usually in the capital of the country.

"With the Caravan, we will be bringing the show into the local area and to the local users. Local sales reps or direct salesmen will be able to talk to users just in their area of responsibility."

At the same time, Sudkin noted that the market for U.S.-made products is strong and

growing in Europe. "The Department of Commerce trade shows have been particularly successful," he noted, "even though they have always been in central locations."

He noted that caravan officials had been in touch with the Commerce Department and had received an "enthusiastic" reception.

Research Aid Provided

The three 1973 European Computer Caravans to be sponsored by *Computerworld* will offer exhibitors a three-pronged attack on the European marketplace, according to David Sudkin, consultant on the projects.

"In addition to offering the exposure provided by the tours themselves, the European Caravan staff will provide a market research program for exhibitors and a marketing operations service," he said.

The market research program, Sudkin stated, will provide an exhibitor with data on product potential in specific areas, competition in those areas and application trends identified through the research program.

In addition, the service will offer recommendations on specific marketing strategies designed for each of the areas visited by the caravans, he said.

For example, he said the recession in Europe this year and IBM unbundling had made users more aware of the potential savings available through the use of independent peripherals than they had been before.

In some areas the European communications systems might provide specific problems to manufacturers of communications-related equipment, he added. Therefore, the research program would identify those areas and outline ways the problems could be overcome.

"The whole program will be designed to identify present market characteristics and pinpoint future trends and problem areas

for firms marketing there."

The marketing operations service is designed to evaluate whether a firm should establish direct sales outlets in the areas covered or should turn to sales agents.

Part of this program will be devoted to screening, interviewing and recommending agents.

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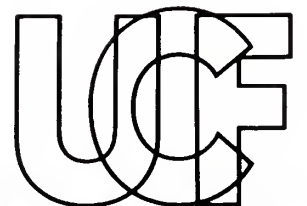
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Data General Enters Numerical Control Field With Contour 1 Mini-Based Unit

SOUTHBORO, Mass. — Data General has made its first entry into the computer numerical control systems market with the announcement of the Contour 1 system.

The basic Contour 1 system is based on a Data General Nova 1220 computer with 8K of core memory, high-speed paper tape readers and a console to control the machine and program-editing functions.

The system can simultaneously control two different machine tools doing different jobs, but the firm said the system could control up to four different tools with the addition of more memory.

The system is available in two versions. The open-loop system costs \$17,100 and the closed-

loop system carries a price tag of \$22,600 and includes a 3-axis discriminator and hardware distance departure counters.

The closed-loop system is used when tolerances of ± 0.0005 in. are required, the firm said, while the open-loop system is designed for jobs with less stringent requirements.

The system has a feed rate of 500 in./sec in both the open-loop and closed-loop operation, and can be used with either linear or circular interpolation, the firm said.

Data General noted computer numerical control is a "new approach" to automating machine processes. It is characterized by use of a small computer to control the operation of one to four machine tools, as opposed to

direct numerical control which uses a large computer to control a series of operations performed by several machine tools.

Computer numerical control, the firm said, is "most useful" in short production runs, where a large percentage of the time for a production run is taken up by machine setup.

The operator's console on the Contour 1 system is designed to allow easy editing of parts programs at the machine tool.

The eye-level control console eliminates the need for a CRT for input and output to the Contour 1 system by using two digital display windows and two 16-button manual data entry keyboards, Data General said.

The control panel is arranged by function; there are 13 control function selector buttons, four editing function buttons, the two manual input keyboards, manual machine jog controls and a manual feed rate override selector.

The manual feed rate override selector lets the machine operator run the machine tool from 0% to 120% of the programmed feed rate. This could be used, for instance, to lower the feed rate as the cutting tool dulls during the work day, the firm said.

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Orders & Installations

Volkswagen Insurance Co. has ordered a Honeywell Model 2040 to replace a Model 200. The new system will handle policy rating, billings, general ledger and management reports as well as agents' commissions and expense accounting.

The Brown Shoe Co. has ordered a second multiterminal key-to-disk system from Logic Corp.

Foremost Insurance Co., Grand Rapids, Mich., has installed an Ampex Model ARM-40 replacement core memory which will double the memory on its 360/40.

Old Dominion University has ordered a Univac Series 70/45 system to handle administrative and instructional work as well as research. The system replaces an IBM 1401.

Carlton Industries, a Richmond, Va., warehousing firm, has ordered its second NCR Century 300 for inventory control and other reports.

The University of Illinois has purchased two ECM-75 extended-core memories and leased three DS-314 disk systems from Ampex Corp. to expand its IBM 360/75, which is used for research and instructional purposes.

Fisher Food Inc. has ordered a Univac 1106 system to handle inventory control, general accounting and payroll processing.

McRae's Department Stores has ordered 150 NCR 280 point-of-sale terminals, six NCR data collectors and an NCR Century 200.

Southern Methodist University has purchased a Control Data Corp. Cyber 70 Model 72 system to handle a variety of academic and research applications. During conversion, the university will use CDC's Cybernet network.

United Telephone Co. of Ohio was the first company to install an IBM 3505 card reader and 3525 card punch. The unit, linked to a 370/145, is used to process toll charges.

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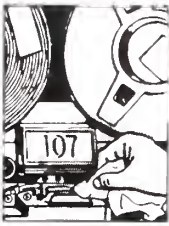


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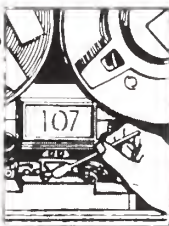
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Mohawk Unveils 2021 Cartridge Drive

HERKIMER, N.Y. — Mohawk Data Sciences Corp. has unveiled the single-drive motor Model 2021 Cartridge Tape Drive.

The unit uses the 3M Co. DC300A Data Cartridge with 300 ft of 1/4 in. tape. Circuit cards are interchangeable for increased performance and reliability.

Features include a fixed-position dual-gap read-while-write head, 800- to 1,600 bit/in. recording on one, two, or four channels, and 30 in./sec read/write speed.

Pricing, in OEM quantities, ranges from \$200 to \$500 for the complete unit with elec-

tronics.

8-Bit Core Memory Shown

ASBURY PARK, N.J. — A new 8-bit core memory system is designed especially for factory

New OEM Products

automation applications from United Telecontrol Electronics, Inc. (UTE).

The system has a speed of 1.2 μ sec, and is capable of one-half or full cycle operation. The plug-in core stack is mounted on the back of the 10-in by 14-in. PC board.

Capacity can be expanded in parallel up to 32K by 8 bits by adding additional storage cards.

Single unit price is \$1,295, and \$795 each in quantities of 100.

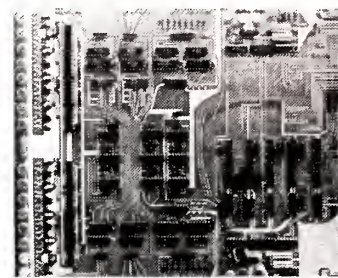
Other New Products

Intel Corp., Santa Clara, Calif. offers a prototyping board to facilitate design of MCS microcomputers using Intel's Type 8008 8-bit memory on a chip.

An analog-to-digital converter with binary-coded-decimal output, the ADC, Model GMAD-2 (BCD) from Preston Scientific Inc., Anaheim, Calif., offers 4-digit BCD plus sign readout, at



Mohawk 2021 Cartridge Drive
a conversion speed of 10 μ sec.



UTE 8-Bit Core
up to 30 reading/sec, and costs \$280 in single quantity.

Newport Laboratories, Santa Ana, Calif., has announced two digital panel meters. The Series 2000A will store a reading indefinitely, on external command and has a reading rate up to 20 reading/sec.

The Series 2000B can handle

A new BCD digitally programmable high-voltage power supply which can be computer controlled from a remote location is available from Spellman High Voltage Electronics Corp., Bronx, N.Y.

Astrodata Exits From Chapter 11

Special to Computerworld

ANAHEIM, Calif. — Astrodata Inc., which has been in Chapter 11 proceedings for 20 months, said its reorganization plan has been approved by the Federal Bankruptcy Court.

The plan, announced last November, calls for a group of investors to take over the Anaheim-based firm for about \$1.5 million in cash.

Astrodata makes a solid-state computer Telex system for international and gateway companies such as RCA, ITT and Western Union International.

It also makes computer controls such as TWX to Telex converters and has under development computer-controlled toll-ticketing equipment.

Herbert L. Brown, president and chief executive officer of Astrodata, said the company is still operating in the red and has been living off its backlog. He could not predict how many months it would take to get the company in the black.

The reorganization plan includes a 1-for-10 reverse stock split, which was approved by shareholders Aug. 3. There will be no cash payments but a 5% stock payment to creditors and shareholders, will be made, plus 2.5% to preferred shareholders and 8% to 10% to the bank, depending on the net worth of the company.

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Minnesota Real-Time

The Minneapolis and Hennepin County police forces have installed a real-time communications network discussed here by county Sheriff Donald Omdt and Lt. Thomas Alman of the Minneapolis police. Lt. Donald Vodegal of the sheriff's office operates one of the 31 Uniscope 100 display terminals in the system, which is based on a Univac 418-II computer at the Minnesota State Crime Bureau.

Multimedia Data Entry Systems Forecast As Manufacturers Add to Present Units

DALLAS — Data entry equipment will move more toward mixed systems and away from its fragmented nature, Dallas Talley, marketing manager for General Computer Systems, said in a recent interview.

In addition, he noted that users are becoming more confident in the use of key-to-disk or shared-processor systems than they previously have been, which is causing more orders for the manufacturers.

Data entry systems of the future will include more features, such as key-to-disk systems also with the capability to handle OCR and to act as remote terminals, he said.

"We are already working on linking OCR to our system in England," he said, indicating that such

systems would become common in the U.S. in the near future.

Remote Concept

The concept of putting key-to-disk terminals at remote sites and communicating to the central data entry facility by telephone lines is also catching on, he added.

With such systems, Talley indicated, the user can perform data entry at the source of the original documents and therefore cut down on errors and turnaround time.

Often, he noted, if there is a mistake on a source document the data entry center has to return the document to the original source for correction,

which is time-consuming. But if the entry is done at the original site and the mistake is caught there, the error can be corrected more quickly and accurately.

Input Edit

By allowing the input to be edited at the source, he said, data entry error rates should drop substantially.

"It is unnatural for a firm to bring every document to a central source," he indicated, "but many firms started to do just that in the days of the keypunch department."

The whole process led to delays and errors, he indicated, noting "the data entry function should be put at the source of the document so that errors or problems can be corrected by the people who understand the purpose of the source material, not by operators separated from the source."

There is still a long way to go before this type of technique will be widely used, he said, but the use is growing. The major factors hindering the growth of more distributed data entry systems lie in software and memory, he said.

Memory Costs

But at the same time, he noted that the cost of memory was coming down dramatically so that key-to-disk systems would be able to add more with little if any increase in price.

The larger memories will also allow the firms to do more with their software, he added.

In fact, he said, the day may come when the systems do not use a disk at all, but rather key the information directly to low-cost solid-state memories.

Talley indicated that the biggest years of marketing of key-to-disk systems as presently put together would come in the 1973-1974 period, but that after that firms would have to offer mixed systems that combine different data entry technologies.

He predicted the market for such combination systems would probably reach \$300 million a year during 1975 and 1976.

The increased user confidence in the key-to-disk systems has come primarily because the manufacturers have proven they are reliable units, he said.

The user was worried at first that the systems would go down, leaving him with several operators not working, since a failure in the central unit could put the entire system down, he said.

But the firm has found that such occurrences do not happen very often and that most failures in such systems occur at only one data entry system, only putting one operator out of work during repairs.

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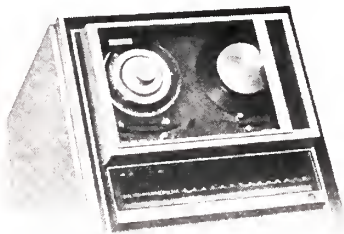
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Inforex Shows First Profit

3 Data Entry Firms Boost Half Revenues

Three manufacturers of data entry equipment have announced improved results, with Computer Machinery Corp. cutting its second-quarter loss, Sycor Inc. showing record revenues and Inforex Inc. operating at a profit in the half year.

Sycor posted revenues of \$6.1 million for the six months ended June 30, with earnings of \$159,200, or 5 cents a share, compared with revenues of \$3.6 million and a loss of \$897,200 in

the 1971 period.

In the second quarter, revenues were \$3.1 million, up from \$2 million in the year-ago period, and earnings totaled \$123,500 compared with a loss of \$352,900.

The second quarter at Inforex marked the firm's first profitable quarter, with revenues of \$5.4 million, up from \$1 million in the same 1971 quarter. Earnings, including an extraordinary tax-loss credit of \$175,000, were

\$203,764, or 9 cents a share, up from the loss of \$1.2 million, or 67 cents a share, in the 1971 period.

In the six months, revenues totaled \$9.7 million compared with \$1.5 million a year ago. Earnings reached \$9,863 compared with the loss of \$2.4 million in the 1971 half.

At Computer Machinery Corp., second-quarter revenues more than tripled those of a year ago, and in the first half the revenues exceeded the total for all of 1971.

Revenues for the three months totaled \$7.5 million, up from \$2.3 million in the 1971 period and \$3.2 million in the first quarter of this year.

The quarter loss, which included an extraordinary credit of \$107,000, was cut to \$803,000, or 17 cents a share, from \$1.1 million, or 29 cents a share, last year.

But a first-period loss of \$1.3 million boosted the loss for the half to \$2.1 million, or 43 cents a share, compared with \$1.8 million, or 46 cents a share, last year.

Orders for the half year reached a record level, rising 54% above the level in the same six months of 1971, according to President Thomas L. Ringer.

Hewlett-Packard Marks 3d Quarter With Improved Revenues, Earnings

PALO ALTO, Calif. — Hewlett-Packard Co.'s third-quarter earnings report reflects continued improvement in both sales and earnings.

Earnings rose to \$9.3 million, or 35 cents a share, from \$5.4 million, or 20 cents a share, in the 1971 period, a 97% gain in the quarter ended July 31. Revenues climbed 33%, to \$125 million from \$94 million in the third quarter last year.

Although President William R. Hewlett cautioned that second-quarter percentage figures "should be evaluated in light of the company's relatively weak performance in the first half of 1971" [CW, July 19], the third quarter represents an improvement over the previous period, when earnings were \$8.6 million and sales \$116.6 million.

In the nine months, HP's earnings rose 57% to \$24.5 million, or 93 cents a share, from \$15.6 million, or 60 cents a share, in the 1971 period. Revenues reached \$339.5 million, up 24%.

All of HP's operating divisions are reporting a higher level of business this year, according to Hewlett.

"Domestic markets have been particularly strong," he noted, adding that orders from U.S. customers amounted to \$230.6 million for the nine months, a 31% jump from the 1971 period. International orders for the same period rose 19% to \$144.5 million.

Intel Foresees Profit Despite Period Loss

SAN FRANCISCO — Despite a second-quarter loss and decline in revenues, which followed the pattern set in the first quarter, Intel Corp.'s "turnaround plans and objectives remain on target and we will be operating on a highly profitable basis by year end," according to President Peter S. Redfield.

Revenues for the second quarter ended June 30 dropped to \$20.1 million from \$27.8 million for continuing operations in the same period last year. The firm reported a loss of \$1.3 million, or 17 cents a share, compared with earnings of \$2.4 million, or 34 cents a share, in the 1971 period.

"These results reflect the start-up of new programs, products and services during the first half of the year," explained Redfield.

In the half year, revenues were \$39.6 million compared with \$55.5 million from continuing operations in 1971. The loss was \$2.8 million, or 38 cents a share, compared with earnings of \$5.5 million, or 45 cents a share.

Revenues, Loss Climb In Quarter at Data 100

MINNEAPOLIS — Second-quarter revenues rose at terminal maker Data 100 Corp., but so did the loss.

Revenues rose to \$2.4 million from \$748,000 in the 1971 quarter ended June 30, and the loss climbed to \$1.5 million, or \$1.19 a share, from \$1 million, or 89 cents a share, in the period last year.

In the six months, revenues totaled \$4.1 million and the loss was \$3.4 million, or \$2.66 a share.

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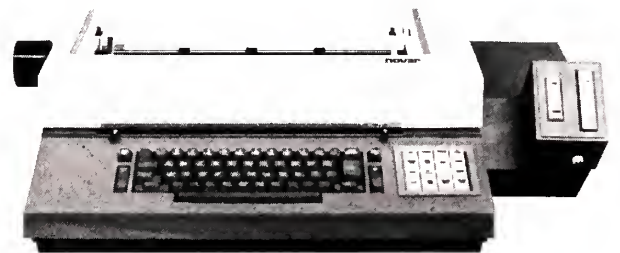
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| | | | | | |
|---|----------------------|-------|--------|-------|------|
| O | ADVANCED COMP TECH | 1-3 | 2 5/8 | + 1/8 | +5.0 |
| A | APPLIED DATA RES. | 4-7 | 4 1/2 | - 3/8 | -7.6 |
| O | APPLIED LOGIC | 1-4 | 2 1/2 | 0 | 0.0 |
| N | AUTOMATIC DATA PROC | 72-99 | 89 1/8 | - 7/8 | -0.9 |
| O | BRANDON APPLIED SYST | 1-2 | 1 1/8 | 0 | 0.0 |
| O | COMPUTER DIMENSIONS | 6-14 | 6 1/2 | + 1/4 | +4.0 |
| O | COMPUTER DYNAMICS | 1-4 | 1 1/4 | 0 | 0.0 |
| O | COMPUTER NETWORK | 4-7 | 5 5/8 | 0 | 0.0 |
| N | COMPUTER SCIENCES | 6-10 | 6 | - 1/4 | -4.0 |
| O | COMPUTER TECHNOLOGY | 4-8 | 4 1/4 | + 1/4 | +6.2 |
| O | COMPUTER USAGE | 7-14 | 7 3/8 | - 1/8 | -1.6 |
| O | COMP AUTOMOT REPORTS | 5-9 | 5 1/4 | - 1/4 | -4.5 |
| N | COMPUTING & SOFTWARE | 15-28 | 14 5/8 | -1 | -6.3 |
| O | COMRESS | 1-3 | 1 1/2 | - 1/8 | -7.6 |

| | | | | | |
|---|----------------------|-------|--------|--------|-------|
| O | COMSHARE | 5-10 | 6 3/4 | - 3/4 | -10.0 |
| O | DATATAB | 5-9 | 4 7/8 | - 1/8 | -2.5 |
| O | EDP RESOURCES | 3-8 | 3 1/4 | + 1/2 | +18.1 |
| A | ELECT COMP PROG | 2-5 | 2 1/8 | 0 | 0.0 |
| N | ELECTRONIC DATA SYS. | 43-65 | 54 3/8 | + 3/4 | +1.3 |
| O | INFORMATICS | 6-11 | 6 3/8 | + 1/8 | +2.0 |
| O | I.O.A. DATA CORP | 1-3 | 1 1/2 | - 1/2 | -25.0 |
| O | KEANE ASSOCIATES | 4-7 | 4 1/2 | 0 | 0.0 |
| O | KEYDATA CORP | 7-13 | 12 | - 1/2 | -4.0 |
| O | LOGICON | 4-9 | 5 1/2 | - 1/2 | -8.3 |
| A | MANAGEMENT DATA | 5-10 | 5 3/8 | - 1/4 | -4.4 |
| O | NATIONAL CSS INC | 8-28 | 27 | +2 1/4 | +9.0 |
| P | ON LINE SYSTEMS INC | 8-20 | 18 7/8 | + 1/8 | +0.6 |
| H | PLANNING RESEARCH | 10-17 | 10 1/2 | + 1/8 | +1.2 |

| | | | | | |
|---|----------------------|-------|-------|-------|-------|
| O | PROGRAMMING METHODS | 20-24 | 22 | 0 | 0.0 |
| O | PROGRAMMING & SYS | 1-2 | 1 1/8 | - 1/8 | -10.0 |
| O | SCIENTIFIC COMPUTERS | 2-4 | 2 1/8 | - 1/8 | -5.5 |
| O | SIMPLICITY COMPUTER | 1-5 | 3 3/4 | - 1/8 | -3.2 |
| O | TBS COMPUTER CENTERS | 4-6 | 4 1/2 | - 1/8 | -2.7 |
| O | TCC INC | 1-3 | 1 1/4 | 0 | 0.0 |
| O | TYMSHARE INC | 7-11 | 9 | + 1/4 | +2.8 |

| | | | | | |
|---|----------------------|-------|-------|-------|------|
| O | UNITED DATA CENTER | 5-8 | 6 | 0 | 0.0 |
| N | UNIVERSITY COMPUTING | 13-26 | 13 | - 1/2 | -3.7 |
| A | URS SYSTEMS | 6-10 | 8 1/8 | - 5/8 | -7.1 |
| O | VORTEX CORP | 2-5 | 3 3/4 | + 1/4 | +7.1 |

PERIPHERALS & SUBSYSTEMS

| | | | | | |
|---|---------------------|-------|--------|--------|------|
| N | ADDRESSOGRAPH-MULT | 34-49 | 41 5/8 | -2 3/8 | -5.3 |
| O | ADVANCED MEMORY SYS | 12-23 | 15 3/4 | + 1/2 | +3.2 |
| N | AMPEX CORP | 6-15 | 6 3/8 | + 1/8 | +2.0 |
| O | ANDERSON JACOBSON | 5-8 | 4 5/8 | 0 | 0.0 |
| O | ATLANTIC TECHNOLOGY | 1-11 | 1 | 0 | 0.0 |
| A | BOLT, BERANEK & NEW | 5-21 | 17 3/4 | + 3/8 | +2.1 |
| N | BUNKER-RAMO | 9-14 | 10 5/8 | - 1/4 | -2.2 |

| | | | | | |
|---|----------------------|-------|--------|--------|-------|
| A | CALCOMP | 11-25 | 12 | +1 1/8 | +10.3 |
| O | CENTRONICS DATA COMP | 11-53 | 47 1/2 | +1 1/2 | +3.2 |
| O | COGNITRONICS | 3-5 | 3 | 0 | 0.0 |
| O | COMPUTER COMMUN. | 1-7 | 2 3/8 | - 1/4 | -9.5 |
| A | COMPUTER EQUIPMENT | 3-4 | 2 5/8 | - 1/8 | -4.5 |
| O | COMPUTER MACHINERY | 7-13 | 9 7/8 | - 1/8 | -1.2 |
| A | COMPUSET | 4-9 | 4 1/2 | - 1/8 | -2.7 |

| | | | | | |
|---|--------------------|-----|-------|-------|-------|
| A | DATA PRODUCTS CORP | 3-7 | 3 7/8 | - 1/8 | -3.1 |
| O | DATA RECOGNITION | 1-5 | 1 1/4 | - 1/4 | -16.6 |
| O | DATA TECHNOLOGY | 2-5 | 2 5/8 | - 3/8 | -12.5 |
| O | DIAN CONTROLS | 0-8 | 4 7/8 | - 1/8 | -2.5 |
| O | DIGITRONICS | 2-4 | 2 7/8 | + 1/4 | +9.5 |
| N | ELECTRONIC M & M | 4-8 | 4 | - 1/4 | -5.8 |
| O | FABRI-TEK | 2-5 | 3 | - 1/2 | -14.2 |

| | | | | | |
|---|----------------------|-------|--------|-------|-------|
| O | GENERAL COMPUTER SYS | 7-16 | 10 1/4 | 0 | 0.0 |
| N | GENERAL ELECTRIC | 59-70 | 66 3/4 | + 1/4 | +0.3 |
| N | HAZELTINE CORP | 9-13 | 8 5/8 | - 1/8 | -1.4 |
| O | INFOTEC INC | 21-36 | 21 | -1 | -4.5 |
| O | INFORMATION DISPLAYS | 1-5 | 2 7/8 | - 1/8 | -4.1 |
| A | LUNDY ELECTRONICS | 9-14 | 10 3/8 | + 1/4 | +2.4 |
| O | MANAGEMENT ASSIST | 1-2 | 3/8 | - 1/8 | -25.0 |

| | | | | | |
|---|-------------------|-------|--------|--------|------|
| N | MEMOREX | 17-38 | 16 7/8 | - 3/8 | -2.1 |
| A | MILGO ELECTRONICS | 17-44 | 25 | -1 5/8 | -6.1 |
| N | MOHAWK DATA SCI | 15-27 | 14 1/2 | -1 1/2 | -9.3 |
| O | OPTICAL SCANNING | 7-16 | 10 3/4 | 0 | 0.0 |
| O | PERTEC CORP | 8-17 | 9 5/8 | - 3/8 | -3.7 |
| O | PHOTON | 7-15 | 8 1/2 | - 3/8 | -4.2 |
| A | POTTER INSTRUMENT | 9-21 | 9 1/8 | - 3/8 | -3.9 |

| | | | | | |
|---|--------------------|-------|--------|--------|-------|
| O | PRECISION INST. | 4-13 | 6 1/4 | - 1/4 | -3.8 |
| O | RECOGNITION EQUIP | 8-15 | 7 5/8 | 0 | 0.0 |
| N | SANDERS ASSOCIATES | 13-21 | 15 1/8 | - 3/8 | -2.4 |
| O | SCAN DATA | 7-13 | 8 | - 1/8 | -1.5 |
| O | STORAGE TECHNOLOGY | 17-39 | 30 3/8 | - 1/8 | -0.4 |
| O | SYCOR INC | 7-11 | 10 3/4 | + 1/4 | +2.3 |
| O | TALLY CORP. | 8-15 | 10 1/4 | +1 1/8 | +12.3 |

| | | | | | |
|---|---------------|-------|--------|--------|------|
| N | TEKTRONIX INC | 34-64 | 55 3/8 | +3 1/4 | +6.2 |
| N | TELEX | 6-15 | 7 1/2 | - 3/4 | -9.0 |
| O | WILTEK INC | 10-26 | 17 | 0 | 0.0 |

SUPPLIES & ACCESSORIES

| | | | | | |
|---|---------------------|-------|--------|--------|------|
| O | BALTIMORE BUS FORMS | 6-9 | 6 3/4 | + 1/4 | +3.8 |
| A | BARRY WRIGHT | 9-14 | 12 1/2 | - 1/8 | -0.9 |
| A | DATA DOCUMENTS | 17-26 | 20 1/4 | + 1/2 | +2.5 |
| O | DUPLEX PRODUCTS INC | 8-16 | 8 3/4 | - 1/4 | -2.7 |
| N | ENNIS BUS. FORMS | 7-10 | 6 5/8 | - 1/8 | -1.8 |
| O | GRAHAM MAGNETICS | 15-27 | 19 1/2 | +1 1/2 | +8.3 |
| O | GRAPHIC CONTROLS | 12-15 | 12 | - 1/2 | -4.0 |

| | | | | | |
|---|--------------------|-------|--------|-------|------|
| N | 3M COMPANY | 76-85 | 79 5/8 | - 1/4 | -0.3 |
| O | MOORE BUS. FORMS | 42-56 | 53 5/8 | - 7/8 | -1.6 |
| N | NASHUA CORP | 48-62 | 60 1/8 | - 5/8 | -1.0 |
| O | REYNOLDS & REYNOLD | 37-77 | 43 3/4 | +1 | +2.3 |
| O | STANDARD REGISTER | 14-20 | 17 | 0 | 0.0 |

| E | X | C | H | 1972 RANGE (1) | CLOSE SEP 07 1972 | WEEK NET CHNGE | WEEK PCT CHNGE |
|---|---|---|---|----------------------|-------------------------|----------------------|----------------------|
|---|---|---|---|----------------------|-------------------------|----------------------|----------------------|

COMPUTER SYSTEMS

| | | | | | |
|---|----------------------|---------|---------|--------|-------|
| O | TAB PRODUCTS CO | 14-20 | 20 | +3 | +17.6 |
| N | UARCO | 22-28 | 21 3/4 | - 3/4 | -3.3 |
| A | WABASH MAGNETICS | 7-11 | 7 5/8 | - 1/4 | -3.1 |
| N | WALLACE BUS FORMS | 22-26 | 22 1/2 | - 1/4 | -1.0 |
| M | BURROUGHS CORP | 147-226 | 209 1/2 | -1 1/4 | -0.5 |
| N | COLLINS RADIO | 14-20 | 14 7/8 | - 1/4 | -1.6 |
| O | CONTROL DATA CORP | 43-78 | 72 5/8 | -2 1/4 | -3.0 |
| O | DATA GENERAL CORP | 56-115 | 101 | - 1/2 | -0.4 |
| O | DIGITAL COMP CONTROL | 9-25 | 11 1/2 | 0 | 0.0 |
| O | DIGITAL EQUIPMENT | 72-101 | 90 1/2 | -3 3/4 | -3.9 |
| N | ELECTRONIC ASSOC. | 6-13 | 9 5/8 | - 1/8 | -1.2 |

| | | | | | |
|---|----------------------|---------|---------|--------|------|
| A | ELECTRONIC ENGINEER. | 7-14 | 6 3/4 | - 1/4 | -3.5 |
| N | FOXBOPO | 26-41 | 28 | + 1/4 | +0.9 |
| O | GENERAL AUTOMATION | 13-38 | 36 1/2 | +2 | +5.7 |
| O | GRI COMPUTER CORP | 3-5 | 4 1/4 | + 1/8 | +1.0 |
| N | HEWLETT-PACKARD CO | 46-77 | 68 1/8 | -2 7/8 | -4.0 |
| N | HONEYWELL INC | 130-170 | 151 | -6 | -3.8 |
| N | IBM | 333-426 | 399 1/2 | -9 | -2.2 |

| | | | | | |
|---|-------------------|-------|--------|--------|-------|
| O | INTERDATA INC | 8-16 | 11 3/4 | - 5/8 | -5.0 |
| O | MICROPATA CORP | 5-10 | 8 1/4 | -1 | -10.8 |
| N | NCR | 29-37 | 37 1/4 | +1 1/2 | +4.1 |
| N | RAYTHEON CO | 31-47 | 31 1/8 | - 3/8 | -1.1 |
| N | SPEER PAND | 30-48 | 42 7/8 | -2 1/8 | -4.7 |
| A | SYSTEMS ENG. LABS | 10-16 | 10 1/4 | + 3/8 | +3.7 |
| N | VARIAN ASSOCIATES | 14-22 | 21 3/4 | + 1/2 | +2.3 |

| | | | | | |
|---|--------------------|---------|---------|--------|------|
| N | VICTOR COMPTOMETER | 15-24 | 18 1/2 | + 3/8 | +2.0 |
| N | WANG LABS. | 34-61 | 36 1/2 | - 3/4 | -2.0 |
| N | XEROX CORP | 121-172 | 154 1/4 | -2 3/8 | -1.5 |

LEASING COMPANIES

| | | | | | |
|---|----------------------|------|-------|-------|-------|
| A | ROOHE COMPUTEP | 5-18 | 5 3/8 | - 1/4 | -4.4 |
| O | BRESMAHAN COMP. | 2-3 | 2 | - 1/8 | -5.8 |
| O | CONDISCO INC | 3-18 | 16 | 0 | 0.0 |
| O | COMMERCE GROUP CORP | 5-11 | 7 1/8 | + 7/8 | +14.0 |
| O | COMPUTER EXCHANGE | 1-3 | 1 1/8 | 0 | 0.0 |
| A | COMPUTER INVTSPS GPP | 8-14 | 8 7/8 | - 3/8 | -4.0 |
| N | OPF INC | 5-13 | 5 3/4 | 0 | 0.0 |

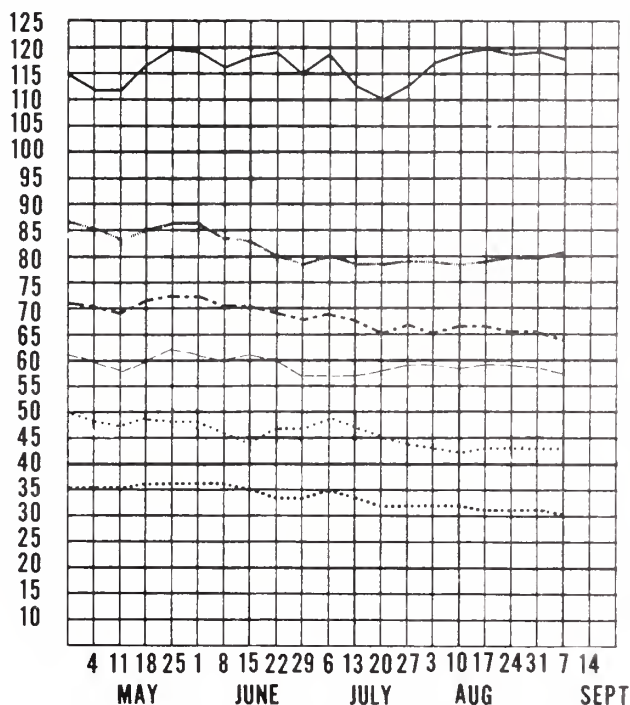
| | | | | | |
|---|--------------------|-------|--------|-------|------|
| N | DATRONIC RENTAL | 2-4 | 1 3/4 | - 1/8 | -6.6 |
| A | DCL INC | 5-10 | 5 1/2 | 0 | 0.0 |
| A | DEARBORN-STORM | 16-26 | 17 3/8 | +1 | +6.1 |
| A | OPA, INC. | 5-8 | 5 7/8 | + 1/8 | +2.1 |
| A | GRANITE MGT | 5-11 | 5 1/2 | + 1/8 | +2.3 |
| A | GREYHOUND COMPUTEP | 6-11 | 6 3/8 | 0 | 0.0 |
| A | ITEI | 7-12 | 8 1/8 | - 3/8 | -4.4 |

| | | | | | |
|---|-------------------|-------|--------|--------|-------|
| N | LEASCO CORP | 17-24 | 19 7/8 | -1 5/8 | -7.5 |
| O | LEASPAC CORP | 9-15 | 10 | 0 | 0.0 |
| O | ELECTRO MGT INC | 1-4 | 1 7/8 | + 3/8 | +25.0 |
| A | POCKWOOD COMPUTER | 2-7 | 2 3/4 | - 1/8 | -4.3 |
| O | SYSTEMS CAPITAL | 3-20 | 15 3/8 | +1 | +6.9 |
| N | U.S. LEASING | 19-33 | 30 7/8 | 0 | 0.0 |

EXCH: N=NEW YORK EXCHANGE; A=AMERICAN EXCHANGE
L=NATIONAL EXCHANGE; O=OVER-THE-COUNTER
P=PHIL-BALT-WASH
O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
(1) TO NEAREST DOLLAR

Computer Stocks Trading Index

—— Computer Systems ----- Software & EDP Services
..... Peripherals & Subsystems Leasing Companies
—— Supplies & Accessories ----- CW Composite Index



Earnings Reports

SCANTLIN ELECTRONICS

Six Months Ended June 30

| | 1972 | 1971 |
|---------|-------------|-------------|
| Revenue | \$4,863,373 | \$3,421,258 |
| Loss | 1,513,311 | 2,168,483 |

COMPUTER SCIENCES

Three Months Ended June 30

| | 1972 | 1971 |
|----------|--------------|------------|
| Shr Eand | ... | ... |
| Revenue | \$31,450,000 | 29,880,000 |
| Earnings | (1,208,000) | 1,207,000 |

COMPUSET

Year Ended May 31

| | 1972 | 1971 |
|----------|-------------|-----------|
| Shr Eand | ... | ... |
| Revenue | \$4,288,536 | 9,174,200 |
| Spec Chg | 690,714 | ... |
| Earnings | (1,453,737) | 68,860 |
| 3 Mo Rev | 1,192,969 | 1,518,986 |
| Spec Chg | 193,714 | ... |
| Loss | 380,938 | 325,388 |

TEXAS INSTRUMENTS

Three Months Ended June 30

| | 1972 | 1971 |
|----------|-------------|-------------|
| Shr Eand | \$1.07 | \$1.77 |
| Revenue | 236,355,000 | 193,042,000 |
| Earnings | 11,844,000 | 8,518,000 |
| 6 Mo Shr | 2.04 | 1.51 |
| Revenue | 452,117,000 | 384,016,000 |
| Earnings | 22,621,000 | 16,694,000 |

UNIVERSITY COMPUTING

Three Months Ended June 30

| | 1972 | 1971 |
|------------|------------|------------|
| Shr Eand | \$1.10 | \$1.31 |
| Revenue | 31,512,000 | 33,051,000 |
| Earnings | 841,000 | 2,387,000 |
| 6 Mo Shr | 1.52 | 1.54 |
| Revenue | 61,998,000 | 67,330,000 |
| bSpec Cred | 10,600,000 | 2,300,000 |
| Earnings | 12,666,000 | 4,093,000 |

a-Restated to reflect accounting changes and acquisitions on a pooling-of-interests basis. b-Capital gains from operations of Gulf Insurance Group.

TCC

Three Months Ended June 30

| | 1972 | 1971 |
|-----------|-----------|-----------|
| Shr Eand | \$1.02 | \$1.02 |
| aRevenue | 2,285,000 | 2,059,544 |
| Loss Disc | ... | 25,066 |
| Op | ... | ... |
| Tax Cred | 68,698 | 53,478 |
| Earnings | 145,179 | 110,826 |

THE FIRST CRUSADE

INCREASING PRODUCTIVITY

You can't run a crusade without people. The investment that goes down in the elevator each night.

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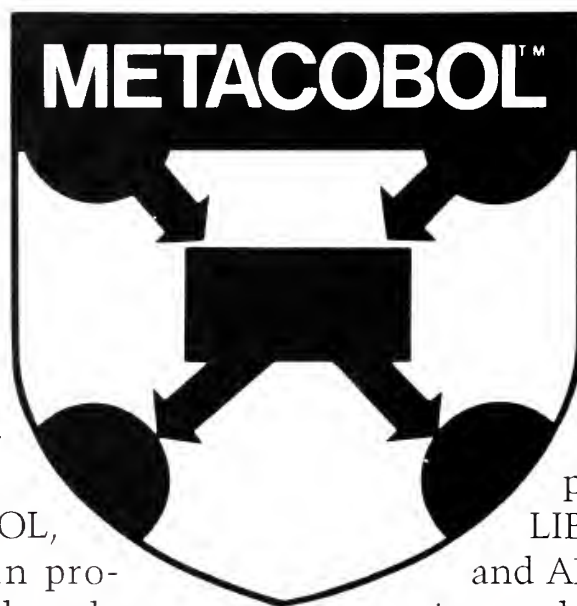
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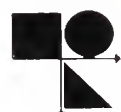
Name _____ Title _____

Company _____ Tel. No. _____

Address _____

City _____ State _____ Zip _____

Computer Configuration _____



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